



MINNESOTA PLANT PRESS

Vol. 9:1 NEWSLETTER OF THE MINNESOTA NATIVE PLANT SOCIETY Fall 1989

LACTARIUS OF MINNESOTA SPHAGNUM BOGS

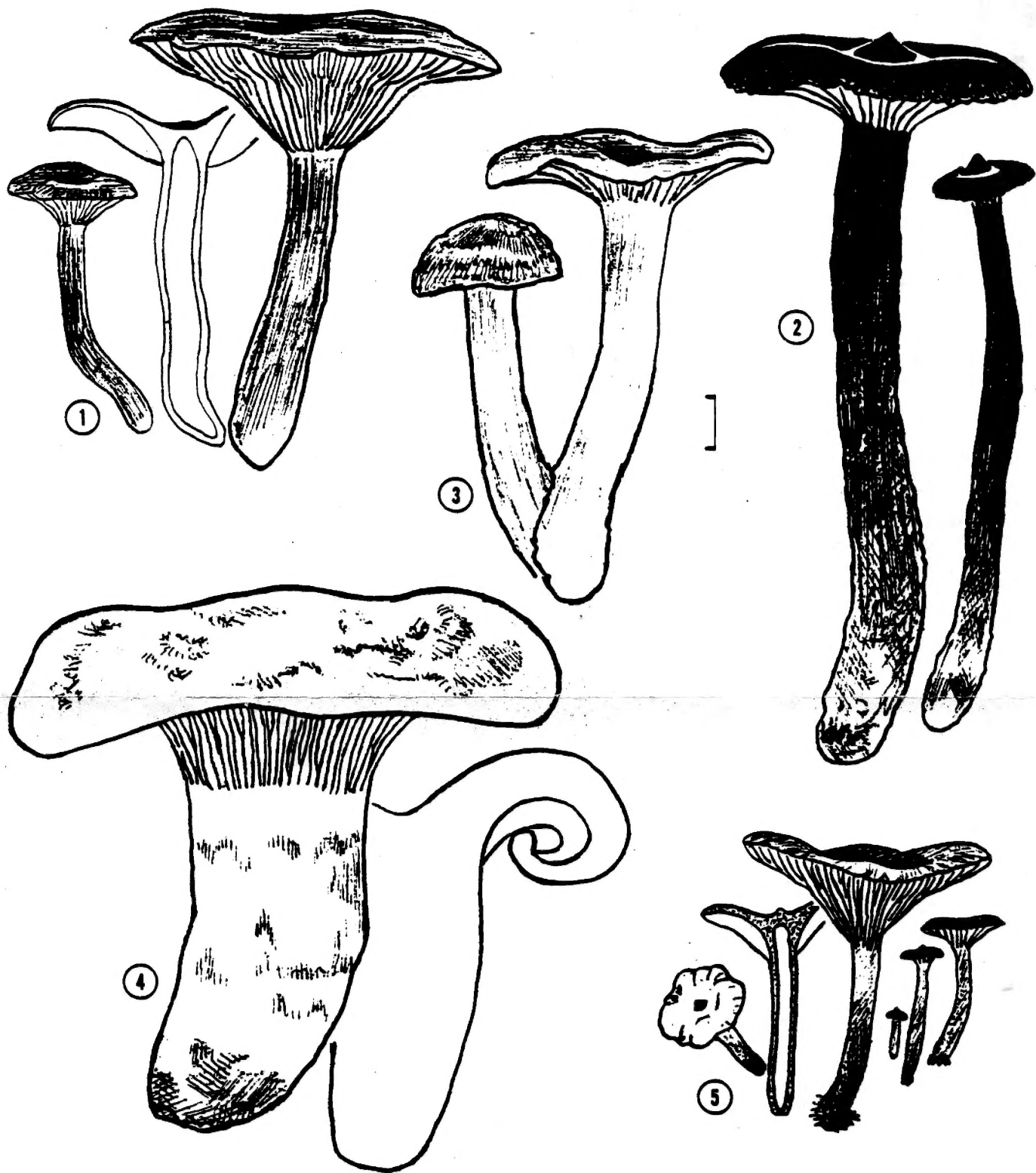
-- Pat Leacock *

Fungi play various roles in an ecosystem. Many are saprophytes, decaying dead plant or animal material, and others are parasites. Those fungi that form lichens with algae are obviously symbiotic, while another fungus lifestyle is less apparent. Mycorrhizal (fungus + root) fungi live in association with the roots of a majority of plants. The fungus mycelium interacts with the root cortex, significantly increasing the plant's uptake of water and important elements such as phosphorus and nitrogen. Many genera of gilled mushrooms form partnerships with temperate forest trees. The genus Lactarius is one example.

Mycorrhizal mushrooms often show specificity to certain habitats and kinds of trees. Of the approximately 35 to 40 species of Lactarii in Minnesota about half are associated with hardwoods such as oak or birch. The remaining species are found with conifers or in mixed woods and the host relationship is often not clear. A sphagnum bog with larch and/or black spruce (and sometimes birch) is a specialized habitat. In Minnesota five Lactarius species have been documented from bogs in Washington, Cass, and Lake counties. Lactarii are separated from other gilled mushrooms by having brittle flesh and a white or colored latex (milk-like fluid) that exudes when the gills or flesh are cut.

Lactarius rufus variety rufus (Fig. 1) is the most common bog species in the Great Lakes region. It is characterized by a dark reddish brown non-viscid cap and stalk of moderate size, with a slowly and strongly acrid taste. The latex is milk-white and unchanging. The spores show a partial net or reticulum.

Lactarius oculatus (Fig. 5) is another common bog species of smaller stature usually found under larch or spruce. The dark reddish brown cap expands to a shallow funnel shape and has a small, central pointed umbo. The color becomes lighter in maturity (moderate reddish brown to brownish orange) but the umbo remains characteristically dark even when dried. The flesh is usually tasteless but may be very slowly peppery and then fading. The white, somewhat watery milk stains paper yellow. The spore



Figures of Fruiting Bodies. (County and Year of collections)
 All figures are taken from the author's collections. Bar equals one centimeter. Copyright 1989 by Patrick R. Leacock.

Fig. 1: Lactarius rufus var. rufus (Cass Co. 1986, Washington Co. 1988)

Fig. 2: L. lignyotus var. canadensis (Washington & Lake counties 1988)

Fig. 3: L. aquifluus (Cass Co. 1969, Washington Co. 1988)

Fig. 4: L. deceptivus (Lake Co. 1986 & 1988, Cass Co. 1989)

Fig. 5: L. oculatus (Washington Co. 1988 & 1989, Cass Co. 1989)

deposit is very pale yellow; the spores feature a broken reticulum.

Lactarius aquifluus (Fig. 3) is widely distributed in conifer or mixed conifer-hardwood forests and peat bogs. This mushroom has a fragrant odor similar to burnt sugar or roasted coffee. The dry cinnamon-brown cap may break up into patches when mature. The taste is mild and the latex is watery and colorless. The spore ornamentation is of ridges and warts forming an irregular partial reticulum. Lactarius rufus, L. oculatus and L. aquifluus all belong to the same subgenus and have hollow fragile stalks.

Lactarius lignyotus is a striking species of conifer forests and bogs. The velvety cap is brownish-black, nearly black when young, with a wrinkled margin and often an umbo. The elongated stalk is similar but paler at the base. Variety canadensis (Fig. 2) has pale yellowish gills that are well separated and have a dark brown margin; the whitish flesh stains pinkish where cut or injured. The roundish spores have a partial reticulum of high warts and ridges.

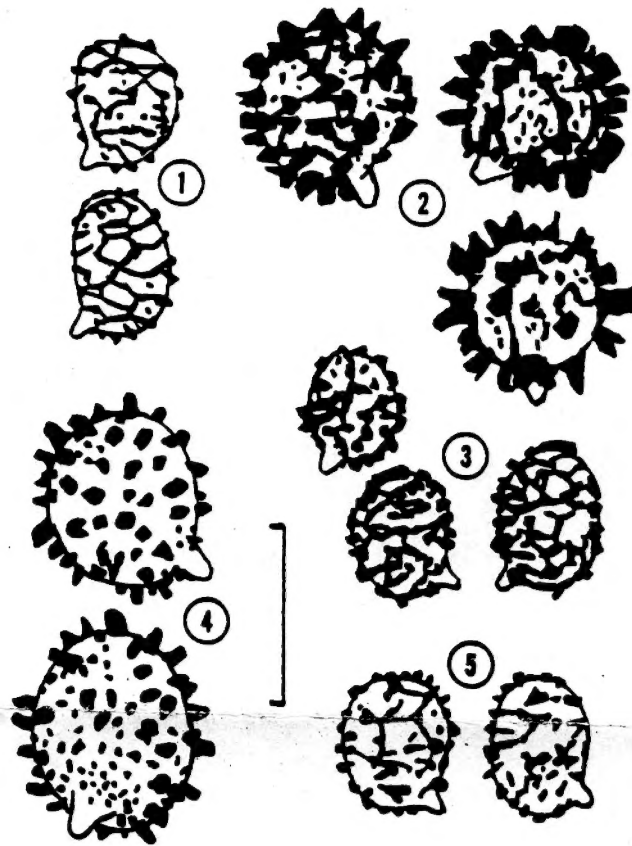
Lactarius deceptivus (Fig. 4) can be found in either conifer or hardwood forests. Two of its associates are hemlock and oak. This large mushroom is unlike the others in having a cottony roll of tissue on the strongly incurved cap margin when young. The dry whitish to pale yellow cap breaks up in age to form scaly patches often staining dark orange-yellow. The white, unchanging latex is quite acrid and stains the tissues brownish. The gills are closely spaced and often forked. The large spores have isolated spines and warts with no interconnecting lines. The stalk is thick and solid. The specimens collected in the bog were deep in the sphagnum with a large weft of mycelium.

There are several other species that can be found in bogs of the Great Lakes region and may turn up with further collecting in Minnesota. Four of the above five species have been found in a small isolated sphagnum-larch bog in Washington County and provide interesting distribution records for the state.

Collecting in Washington County was funded in part by the County Biological Survey of the Department of Natural Resources.

* Pat is a currently a grad student in the Dept. of Plant Biology, UM

Lactarius Spores and their Ornamentation. Bar equals ten micrometers.
All figures are taken from the author's collections. Copyright 1989
by Patrick R. Leacock.



MNPS NEWS *****

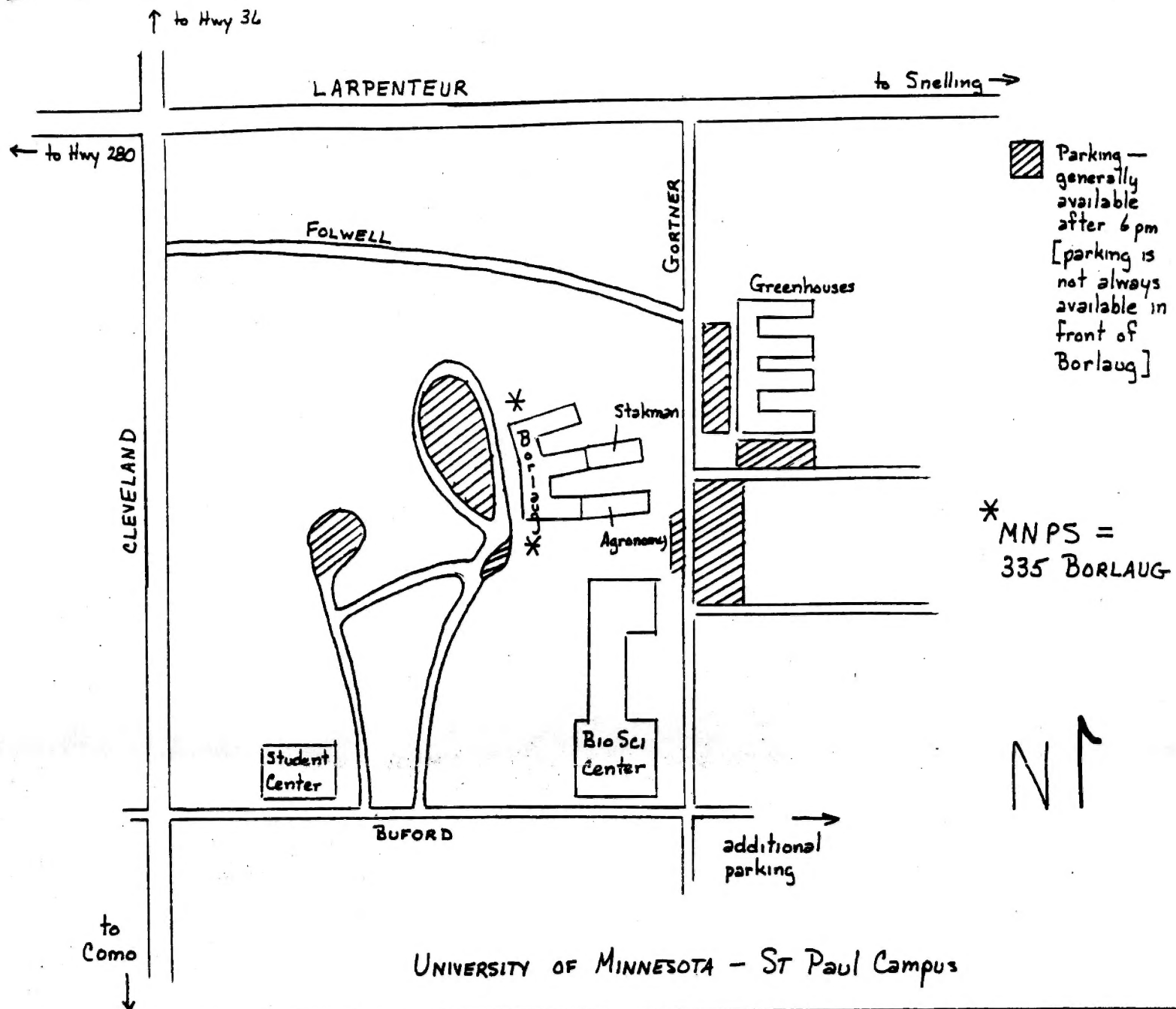
Membership renewal time

Included with this issue of "The Plant Press" is a membership renewal form. Renewals are due by 4 October. **THIS WILL BE YOUR ONLY NOTICE OF RENEWAL.** No additional issues of the newsletter will be sent if you fail to renew at this time (remember, your membership dues help defray the costs of producing and mailing the newsletters). Please take this time to renew your membership and ensure that you are kept up-to-date with regards to MNPS activities. A few members have paid for several years in advance and new members who joined this summer won't need to renew at this time; please check the mailing label on this newsletter for this information.

Upcoming meetings

-- Don Knutson

Another new MNPS year is upon us. The following is a tentative list of speakers and topics for the next several months. All meetings are open to the public and take place on the first Wednesday of each month. They begin promptly at 7:30 pm in 335 Borlaug Hall on the Univ. of Minnesota St. Paul campus



Minnesota Native Plant Society Membership Registration

Mail to: Minnesota Native Plant Society, 220 Biological Sciences Center, University of Minnesota, Saint Paul, Minnesota 55108

New Member

 Renewal

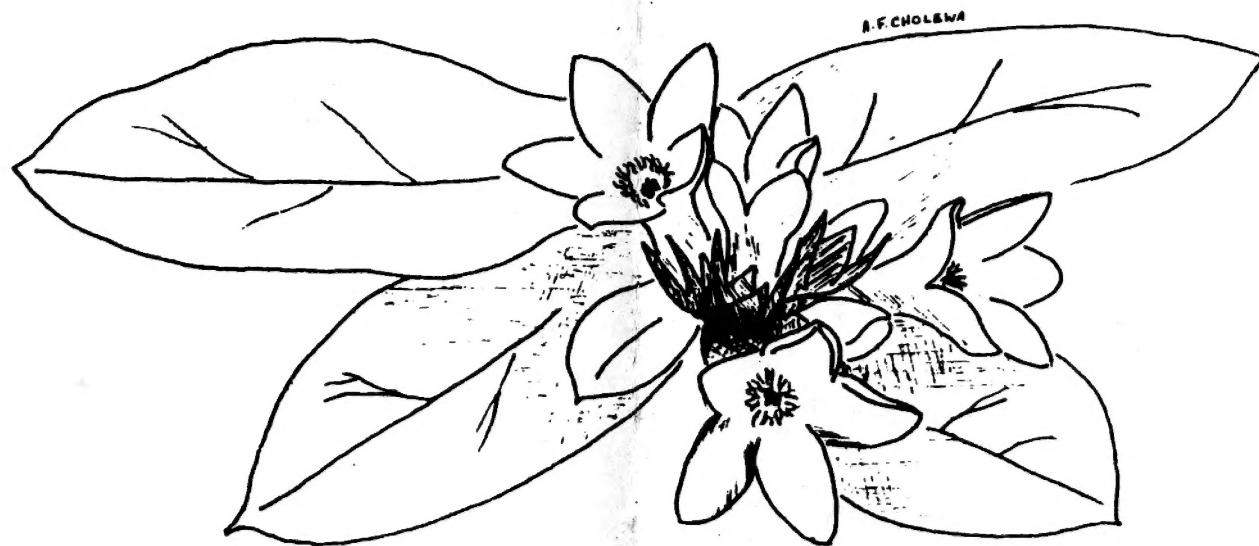
Membership Categories:

\$ 8.00	_____	Individual	\$ 6.00	_____	Senior (over 62 or retired)
\$10.00	_____	Family (Two or more related	\$15.00	_____	Institution
\$ 6.00	_____	Student (Full-time)	\$25.00	_____	Donor

[illegible]

City _____ **State** _____ **Zip** _____ **Phone** _____

U. OF M. CAMPUS ADDRESS



Trailing-arbutus (Epigaea repens)

Not common in Minnesota, trailing-arbutus may be found on sandy soil in the coniferous forests of the northeastern third of the state. The plants are prostrate on the ground with evergreen leaves. The fragrant flowers may be white or pink and are hairy at the mouth of the floral tube. These plants flower soon after snowmelt in the spring and, consequently, are often missed.

(see map). Carpooling is encouraged; please consult the membership directory included with the spring newsletter for members near you.

- 4 October -- Welby Smith, "Minnesota's rare plants"
- 1 November -- Chris Cole & Nancy Sather, "Research & inventory of prairie bush clover, Lespedeza leptostachya"
 - Annual seed exchange (note change of month)
- 6 December -- Don Knutson, "Natural history of dwarf mistletoes"
- 3 January -- Ron Bowen, "Aspects of seed performance of some native plants"
- 7 February -- Mike Heinz, "Historical aspects of early Minnesota (pre-settlement) plant collectors"
- 7 March -- Eville Gorham, "Wilderness values"
- 4 April -- TBA
- 2 May -- Annual Minnesota Botany Exhibition & Slide Show (note change of month)
 - Summer field trip preview

If you have suggestions regarding future topics or speakers, please call Don Knutson, 612-721-6123.

Annual seed exchange -- Ruth Phipps

This year the annual exchange of seeds of native plants will be held as part of the November meeting, rather than the October meeting as was done in the past. This will allow time for the later seeds to have matured.

To prepare for the exchange, please collect only mature seeds that are free of insects and disease. If collecting from wild plants, take only a small percentage of the seeds (leave plenty for nature). Label seed envelopes with the name of plant, collection site, habitat, date of collection, and your name. Please also indicate if the seeds are from a garden or wild plant.

Envelopes for this exchange will be available at the October meeting. If you want to bring already matured seeds to the October meeting, we can store them until the November meeting.

Seeds will be available to all those attending the November meeting, but contributors will be given first selection.

New officers and committee chairs

Our new officers, board of directors, and committee chairs take up their responsibilities as of September 1. If you have questions or information to pass along please contact one of the following persons:

President: Dave McLaughlin 612-333-8806
Vice-president: Don Knutson 612-721-6123
Secretary: Robin Fox 612-642-9118
Treasurer: Char Menzel 612-426-2860

Conservation: Don Knutson 612-721-6123
Education: May Wright 612-429-7674
Historian: Chris Soutter 612-228-0306

Nominations needed for next year's Board of Directors

Yes, we're just starting a new year with several new Board members and Committee Chairs. However, according to our bylaws, we need to begin to think about potential Board members for next year (1990/1991). If you think you might like to serve (3 year term) or you know someone else who might be willing, please submit names and phone numbers to Dave McLaughlin, Dept. of Plant Biology, 220 Bio Sci Center, Univ. of Minnesota, St. Paul, MN 55126 or call him at 612-333-8806 (eve). Please note that being on the Board is a commitment: the Board meets once a month and Board members are asked to be responsible for various society activities. You will not be overloaded with work but you must be willing to do your share. At the same time, without a Board the Society will cease to function.

Volunteer desperately needed - MNPS newsletter editor

Someone is urgently needed to wear the editor's hat for our MNPS newsletter. Obviously there will be work involved, in soliciting articles to be written, arranging items received, and in general keeping the newsletter on track (but the newsletter only appears three times a year). Access to a computer would definitely be helpful. Please contact Anita Cholewa 612-625-0215 ... soon.

Thank-you's to be awarded

A very special thank-you goes to Patricia Ryan, who arranged for our display to be exhibited at "Prairie Day," 19 August, at Afton State Park.

Special thank-you's also go to Patricia Ryan and Anita Cholewa who were asked to take time out from their busy schedule and arrange our display at the State Fair. Thanks also to the UM CBS Greenhouse, Steve Fifield, and Chris Cole, for donating live plants to be used with the display. And to Dwayne Stenlund for seeing that our display was returned to us.

New members

Please welcome the following new members who have joined our Society this past spring and summer ...

Sr. Jane Belanger (Stanchfield); Thomas Casey (Mound); Elizabeth Cedarleaf (Mahtomedi); Karen Clem (Columbia Heights); Cecelia Cope (Bloomington); Linda Huhn (Minneapolis); Cindy Johnson-Groh (Duluth); Kevin Jones & Betty Patenaude (Maple Grove); Fay Kelley (Wyoming); James & Evelyn Ketchum (Prior Lake); Harry Lear (White Bear Lake); Mr. & Ms. Edward Lofstrom (Minneapolis); Mary McGee (Minneapolis); Bill & Cheryl Morrison (Forest Lake); Helen Nordstrom (Lakefield); Gene Plourde (Bloomington); Nancy Schacht & Stanley Mickelsen (West St. Paul); Paul Mielke (Mounds View); Cathy Schleicher (Circle Pines); Phyllis Sherman (St. Paul); Louise Sisson (Roseville); Angela Smuda (Shoreview); Michael & Nancy Steidle (Minnetonka);

Martha Swenson (Minneapolis); Mr. & Mrs. Stan Tekiela (Eden Prairie); Daniel & Mary Jo Truchon (Blaine); D. C. Vaughn (Edina); Jeanine Vorland (Roosevelt); Allison Wolf (Minneapolis); Martin & Gertrude Ziebell (Stillwater).

1989 SYMPOSIUM IN REVIEW

Wetland Restoration was the topic our second annual symposium held on 1 April at Springbrook Nature Center. The following abstracts are provided by the guest speakers.

"The Restoration Process in a Mined Peatland" -- Joyce A. Powers

This paper describes the restoration process for a 270 acre mined peatland in southeastern Wisconsin. Lipha Chemicals Inc., the owner of the land, has proposed a restored natural wetland complex, with a diversity of both water depth and native plant communities as the principal goals of this project. The project was undertaken in 1984 and to date has cost the company somewhat over \$150,000.

Two-hundred-and-seventy-four species, representing one-hundred-and-seventy-four genera and sixty-five plant families were identified on-site before any restoration planting was done. This reflects the natural revegetation process over the many years that mining has been in progress. Three factors appear to be critical in the restoration process: 1) precise grading of the land surface, 2) raising of water levels, and 3) control of exotic species.

"Restoration of Prairie Wetlands" -- Jeanine Vorland

Prairie potholes are a diverse group of wetlands defined largely by varying permanence of water. These wetlands are vital habitat for many species of wildlife in Minnesota. However, prairie wetlands have often been regarded as wastelands, and as an impediment to farming or development. It is estimated that more than 80 percent of wetlands in Minnesota, which existed prior to European settlement, have been lost. Conversion to agricultural uses is the leading cause of loss of prairie wetlands.

Prairie wetlands in Minnesota are usually drained by ditch systems, underground tile, or both. Ephemeral and temporary wetlands, wetlands that generally contain surface water for a few days to a few months, have been most vulnerable to drainage and filling. Seasonal, semi-permanent and permanent wetlands are increasingly more costly and difficult to drain and frequently more difficult and costly to restore, especially where multiple ownerships and jurisdictions are involved. Plant communities associated with prairie wetlands can also be negatively impacted by deep and/or stable water regimes.

Understanding of the function of wetland systems, how plant and animal communities interact with varying water regimes is critical to successful wetland restoration. Watershed, soils, ownership boundaries and legal considerations are important factors to consider when undertaking restoration.

Identification of the drained wetland is the first step toward wetland restoration. Reconnaissance of potential sites at snowmelt is

an extremely useful tool, especially for tile drained wetlands. Reference materials such as air photos and soil maps are important resources in defining wetland basins and approximate water regimes. Resource professionals, such as Soil Conservation District Conservationists, Soil and Water District Technicians and local Wildlife Managers can be helpful in identifying areas for restoration. One of the best resources for information on drained basins can be the individual or individuals responsible for initiating the drainage.

The most commonly used restoration techniques for prairie wetlands include capping tile systems, installing earthen ditch plugs and/or small earthen dikes. Capping tile systems generally involves locating the tile and removing 50 to 100 feet of the system and backfilling with clay soils. Earthen dikes are generally constructed with small crawler tractors during summer or fall. Spillways can be incorporated into the dike. A plastic or metal culvert placed at the desired summer pool depth should be designed to handle most runoff from the wetland. An earthen spillway should be designed to handle spring runoff and floods in order to avoid having water over-top the earthen dike or ditch plug.

Wetland management techniques, especially drawdown (partial or complete dewatering of the wetland during the growing season) are useful tools in restoring wetland plant communities in deep or stabilized wetland systems. Mudflat conditions are necessary for most emergent plants to reproduce from seed. If adequate light and warmth penetrate to the substrate, submergent plants can be extremely productive in fertile prairie wetlands. Partial drawdown is often necessary to restore submergent plant communities to wetlands with high turbidity due to suspended silt and algae.

Prairie wetland plant and animal communities are adapted to and dependent upon unstable water conditions through time. Wetland plant seed banks can be quite long lived and resistant to drought or inundation either natural or forced through activities of humans. Restoration of a water regime approximating natural conditions prior to drainage or stabilization is often all that is necessary to restore vital prairie wetland communities.

"Summary of Savage Fen Restoration" -- Steve Eggers

Steve Eggers, a wetland ecologist with the Corps of Engineers, gave a progress report on restoration of a calcareous fen plant community within the Savage Fen located in the Twin Cities metropolitan area. Calcareous fens are the rarest of Minnesota's wetland plant communities, and little work has been in attempting to restore them [sic]. A roadfill consisting of concrete rubble had been built into the fen in 1984. The restoration entailed removal of the fill and placing peat in the excavated area during November 1986. The following May, the site was planted by Prairie Restorations, Inc. using seedlings or seed of 23 species native to calcareous fens. After 2 full growing seasons, native species such as shrubby cinquefoil and hardstem bulrush were doing very well in colonizing some areas, while weedy/undesirable species such as reed canary grass and witch grass were colonizing other areas. Reed canary grass was subsequently removed by hand. The drought of 1988 seemed to favor weedy, facultative species, but it remains to be seen if these species persist with the return to the more typical water-logged soil

conditions. It is intended to monitor the site for at least 5 growing seasons.

"Symposium Summary" -- Steve Eggers

During the past 15 years, wetland issues have come to the forefront of environmental concerns. This is due in part to state and federal laws (e.g., the Clean Water Act) and a growing public awareness of the functions and values of wetlands. One result is an increasing number of attempts to restore or enhance wetlands. We've learned from past mistakes and have made substantial advancements in our knowledge of wetland restoration, but it is still in the experimental stage. Probably the best advice is to preserve our remaining wetlands so that we don't get into a position of attempting to restore them at some point in the future.

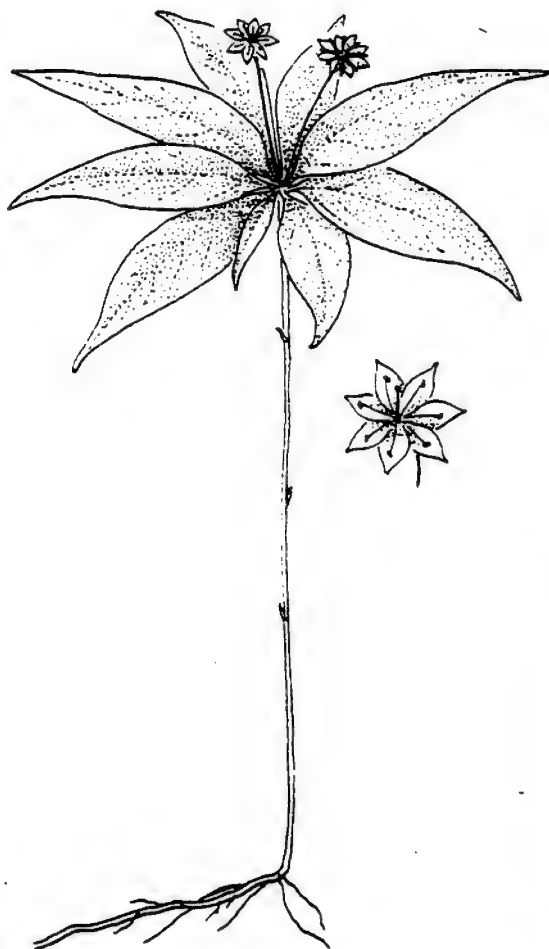
A major point made by the speakers was that it can be very difficult to restore wetland ecosystems. Attempted wetland restorations seem to frequently invoke Murphy's Law -- whatever can go wrong does. No matter how carefully planned and researched, wetland restorations can fail or produce only marginal success. On the other hand, simply plugging a drainage ditch can produce excellent results in some cases. The bottom line is that each site has its own unique combination of soils, hydrology, seed bank, topography, etc. What produced excellent results at one site may not work at another site. Therefore, restoration plans must be site specific.

SUMMER CAMPOUT ANOTHER SPECTACULAR EVENT -- Lyn & Doris Gerdes

The 2nd Annual Minnesota Native Plant Society's Summer Campout was held on the weekend of June 24. Folks gathered near Pallisade, MN (Aitkin Co.), home of Audrey and John Engels where tents were pitched around the farmyard. The farm, an adventure in itself, is rich in family history ... and the tales that go with it. Bluebirds and goldfinches were numerous around camp, while the fields and windrows allowed observations of bobolinks, clay colored sparrows, blackbilled cuckoos, brown thrashers and more.

But what about plants? On Saturday morning Dr. Anita Cholewa led the fieldtrip to Savanna Portage State Park. Our first stop was a marsh where Black Snakeroot (Sanicula marilandica) and Northern Bedstraw (Galium boreale) grew along its wooded edge, while scattered Tufted Loosestrife (Lysimachia thyrsiflora, not related to purple loosestrife) could be found among the grasses and sedges. Dr. Cholewa pointed out the characteristics of Scirpus and Carex of the Cyperaceae and Panicum, Agropyron and Phragmites of the Poaceae. It's moments like these that renew one's hopes in keying the grasses and sedges to species.

The afternoon found us hiking a trail bordering Loon Lake. The mixed "Lake States Forest" presented a wide array of northern MN flora. Wintergreen (Gaultheria procumbens), Twin Flower (Linnaea borealis), Goldthread (Coptis groenlandica), and Star Flower (Tirentalis borealis) were just a few. A Cinnamon Fern (Osmunda



Star flower Trientalis borealis
 From: Cholewa, 1971. Minnesota
 Wild Flowers of Minnesota.

cinnamomea) with fertile leaves also stood near the shoreline, along with this incredible fruiting slime mold. We soon found ourselves on the edge of a bog and the magic really began to happen. The soft coolness of the wet Sphagnum, the smells and unique flora soon found us all pointing in different directions. Pitcher Plants (Sarracenia purpurea), Sundews (Drosera rotundifolia), and Heartleaved Twayblades (Listera cordata) were found in the bog and a few Moccasin Flowers (Cypripedium acaule) were along the black spruce edge.

We left the park and Audrey led us to one of her favorite Showy Lady Slipper (Cypripedium reginae) spots. This wet, shrubby willow area was spotted with pink and white blossoms. The entire area was in prime bloom and the color of the inflated petals seemed to be an extra deep shade of pink. Dr. Cholewa again captured our excitement by sharing her knowledge of orchid pollination. As with all things, the closer one looks at them, the more unique and beautiful they become. One doesn't find it difficult to find the beauty in the Lady Slipper, but the real joy is discovering or sometimes rediscovering the beauty in the small and often overlooked.

Saturday evening found us at the Engels' home watching a slide show prepared by Audrey and Anita. A wide selection of local flora were shown while everyone was trying to learn or recall family, genus, or species. A wonderful ending to a fun day in the woods.

It was a weekend of botanizing, camping, and a chance to spend time with new found friends. The turnout wasn't large by any means; in fact it seemed like a best kept secret. Participants were Arden Aanestad, Dr. Anita Cholewa, Audrey Engels, Rita and Ted Tonkinson, and Doris and Lynden Gerdes. A special thanks to Audrey and John for hosting the campout, and your involvement Audrey in the fieldtrip and slideshow. A special thanks also to Dr. Cholewa for leading the group and sharing so much of your enthusiasm and expertise.

OTHER INTERESTING PLANTS THIS SUMMER

-- Anita Cholewa

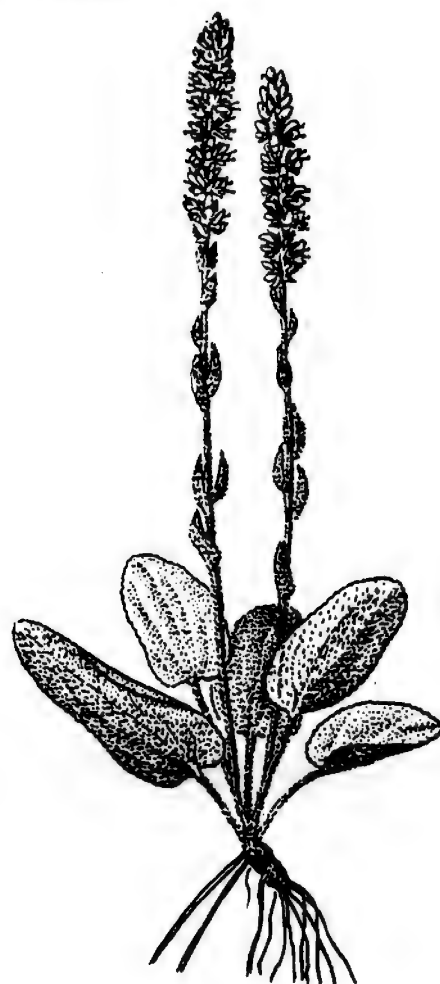
As part of a project I have been doing this summer, I have had the opportunity to see several plants new to me. Some of these are plants not often encountered in Minnesota and maybe some are new to you as well:

walking fern
(Camptosorus rhizophyllus)



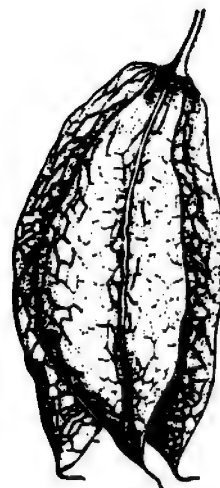
walking fern (Camptosorus rhizophyllus)
from: Evans, R. 1980. Ferns of
Minnesota.

kitten-tails
(Besseya bullii)



Kitten-tails (Besseya bullii)
from: Cowbey, G.D. & A. Monserud. 1971.
Common Wild Flowers of Minnesota.

bladdernut
(Staphylea trifolia)



Bladdernut tree (Staphylea trifolia)
from: Cronquist, A. 1981. An Integrated
System of Classification of Flowering
Plants.

NEWS FROM THE UM HERBARIUM

UM Botany Centennial

This year is the 100th anniversary of the Department of Botany at the University of Minnesota (Twin Cities campuses). It also marks the transformation of the department to the Dept. of Plant Biology, a new course for the University's botanically-oriented programs. In celebration of the Centennial, the Department is sponsoring a symposium, "The Future of Plant Biology," 25-27 October. The annual Herbarium Open House will be held in conjunction with this celebration, each day from 12-1:30 pm (refreshments will be available). All Centennial events are open to the public. For further information contact: Dept. of Plant Biology, 612-625-1234.

Herbarium Volunteers

Early this summer an arrangement was finalized with the St. Paul Campus Central Library, regarding the disposition of numerous books and serials that belonged to the University Library but were housed in the Herbarium. The return of these items to the University Library means these items will be under the watchful eye and tender care of our excellent librarians. The return also means more space is available for the books, journals, and reprints owned by the Herbarium. These latter items, however, have never been catalogued. Volunteers are needed to type reference cards for these books and to help in arranging them in a more usable fashion. If interested call Dr. Anita Cholewa, 612-625-0215.

VOLUNTEERS WANTED AT MN DNR

Volunteers are needed to help with an annual survey of wild nut and berry production across Minnesota's black bear range. A study of black bears in northcentral MN has been conducted since 1981. In addition to movements, food habits, reproduction, and mortality, the study is trying to include information from throughout the range of black bears. Volunteers are needed to help assess the abundance and productivity of different kinds of foods in different parts of the state at different times of the year. If you are interested in helping with this aspect please contact: Karen Noyce, Wildlife Biologist, Grand Rapids Office, 218-327-4432.

VOLUNTEERS WANTED BY MAPLEWOOD NATURE CENTER

Won't you share your love of nature with children? Maplewood Nature Center has openings for volunteers this fall: there are opportunities to act as a trail guide, building receptionist, or an outreach speaker; you can also become involved in trail maintenance or creative displays.

No formal background in natural science is necessary, but enthusiasm and a desire to learn about the natural world is essential.

Attend our orientation and training programs beginning Tuesday, September 12. Please call Maplewood Nature Center at 612-738-9383 for more information. Maplewood Nature Center is located 2659 East Seventh Street in Maplewood.

CONSERVATION CORNER - MINING NEAR THE BWCA -- Northshield, Inc.

Non-ferrous sulfide mining will cause acid drainage. Acid rain is a tea party compared to acid drainage. This mining will irreparably foul this unique area, one of the last large remaining sources of fresh water for the continent. These waters feed not only one of the United States' greatest wilderness areas, but also the Quetico and Canada, including Hudson Bay. Our clean ground waters are more valuable than non-ferrous sulfide mining.

Huge sums of money are being invested to open this area to non-ferrous mineral evaluation and mining. Roger Kuhns of BHP-Utah has stated that their aim is "to make a mine."

Minnesota promotes mining. And two state agencies, the Department of Natural Resources and the Pollution Control Agency, are involved in a project to streamline the permitting and environmental review process for mining. These agencies that should be guardians of our environment have compromised their mission. ...

A high potential for uranium exists in this area ... There are also known recoverable deposits of copper, nickel, and gold. With present technology, the mining of any of these substances must not be allowed here at this time. Non-ferrous sulfide mining coupled with the probability of underlying uranium will have harsh health effects on our people, especially our children.

Already the woods are staked, ribboned, and being brushed.

Public opinion is the most vital and persuasive power that could protect this area from sulfide mineral mining. Your help is urgently needed. ... Write elected officials in Washington, DC, Minnesota, and in other states. Send copies of your letters to us so we can use response statistics. Northshield, Inc., is a positive educational, non-profit, all volunteer groundswell, working from our homes. We have 3000+ hours invested in documentation and are working to bring solidly documented facts to light before this area is gone. Please support or join with us to stop this degradation of our resources. (Donations go toward spreading solidly documented facts. Any donation greatly appreciated). For more information contact: Northshield, Inc., Box 233, Winton, MN 55796.

NEW PUBLICATIONS OF INTEREST

Available from Minnesota's Bookstore, 117 University Ave, St. Paul, 55155 [Greater Minnesota call 1-800-652-9747 and ask for Minnesota's Bookstore]:

Trees of Minnesota - Descriptions of more than 50 trees found in MN. Care and transplanting tips and how to prevent forest fires. \$5.00. Stock No. 9-1.

Natural Vegetation of Minnesota at the Time of the Public Land Survey 1847-1907 - Describes MN's landscape before the impact of white settlement. Contains beautiful photographs showing examples of sites where remnants of natural vegetation have persisted. \$2.00. Stock No. 9-33.

A Guide to Minnesota Prairies - Provides an introduction to MN's diverse prairies and a directory to the 40 select prairie preserves plus photos and maps. \$5.00. Stock No. 9-29.

Available from the North Central Forest Experiment Station, 1992
Folwell Ave., St. Paul, 55108:

Central Hardwood Notes - A new comprehensive U.S. Forest Service publication on managing central hardwood forests, the book is a collection of 85 notes summarizing more than 50 years of research on hardwood forests of the Midwest. Information is provided on managing forests for wildlife, water, recreation, timber, and scenic beauty.

Available from Bluebird Nursery - Native Notes, Rt 2 Box 550,
Heiskell, TN 37828:

Native Notes Newsletter - A newsletter devoted to landscaping with native plants; issued Jan, Apr, Jul, Oct; subscription cost \$10/yr (special rate for Jul 89 - Oct 90 = \$12.00).

Available from Smokey Hills Audubon Society, Box 173, Salina, KA 67401:

Favorite Prairie Wild Flowers and Grasses -- Descriptions and illustrations of 45 common wild flowers and six native grasses of the Great Plains, as well as interesting and informative anecdotes. \$4.50.

Available in local bookstores:

Northwoods Wildlife: A Watcher's Guide to Habitats -- Based on information obtained from wildlife biologists, this is a guide to the Northwoods: a description of 18 different types of wetlands, forest, and open spaces, and the kind of wildlife to be found in each.

GARDENERS' CORNER

The Natural Resources Defense Council recently issued disturbing news regarding bulbs used in the horticultural trade. From their newsletter of 8 June 1989:

"... the Convention in International Trade in Endangered Species of Wild Fauna and Flora (CITES) will meet in October

to address problems plaguing treaty enforcement ... This year, there will be an unusual number of plant proposals, and several may generate considerable controversy ... [as they] affect the horticultural trade in bulbs and orchids."

In addition to many common and exotic garden bulbs (e.g., Galanthus or snowdrops and Pachypodium, a Madagascan succulent) the list also includes some taxa from the U.S.! From the same NRDC newsletter:

"Cyprripedium -- The North American species of lady's slipper orchids are not propagated commercially -- despite misleading claims by some sellers.

Erythronium -- The North American species of this lily genus, except the hybrid, "Pagoda," are wild-collected.

Trillium -- Plants of this genus are certainly from the wild, whatever the seller may claim.

Other plants -- Commonly grown Fritillaria and Iris are propagated but be careful about more specialized species, which are probably collected. Avoid North American Fritillaria."

For more information on these and other bulb-producing plants contact: Natural Resources Defense Council, 1350 New York Ave, N.W., Washington, D.C. 20005.

UPCOMING EVENTS ELSEWHERE

20-21 September 1989 -- Natural Adaptations: Communicating in the 90's, UM Landscape Arboretum. For information call the Arboretum at 612-443-2460.

22 September 1989 -- Nature's Tasty Teas, Eloise Butler Wildflower Garden, 3pm. Limit 15 people. Call the shelter at 612-348-5702 after 10:00 am.

24 September 1989 -- Useful Plants of Minnesota, 1-day course offered by the Bell Museum of Natural History. For information contact the Museum at 612-624-1852.

30 September 1989 -- annual Fall Festival at the UM Landscape Arboretum. Call 612-443-2460 for more information.

30 September 1989 -- Prairie & Bog Tour, Eloise Butler Wildflower Garden, 3:00 pm. Call the shelter at 612-348-5702 for information and to register.

17-20 October 1989 -- 16th Annual Natural Areas Conference, Knoxville, TN. For information and registration contact: Ralph Jordan, 228 Natural Resources Bldg, Tennessee Valley Authority, Norris, TN 37828.

21 October 1989 -- Autumn in the Big Woods, 1-day course at Wolsfeld Woods, offered by the Bell Museum of Natural

History. For information call the Museum at 612-624-1852.

19 November 1989 -- After the Leaves Fall, 1-day course at Bloomington's Nine Mile Creek, offered by the Bell Museum of Natural History. For information call the Museum at 612-624-1852.

26 November 1989 -- Arctic Rivers Slide Program, sponsored by the Bell Museum of Natural History. Naturalist Bill Gould provides a tour of the Arctic's Coppermine River. For information contact the Museum at 612-624-1852.

29 April - 3 May 1990 -- 2nd Annual Conference of the Society for Ecological Restoration, Chicago, IL. For information and registration contact: Keith Winterhalder, Biology Dept., Laurentian University, Sudbury, Ontario, Canada P3E 2C6.

4-6 May 1990 -- Spring Wildflower Weekend, sponsored by the UM Extension Classes, Study & Travel Adventures program. Led by Roberta Sladky (Horticulture Curator at the MN Zoo), this is an outdoor exploration of Wilder Forest. Registration deadline is 17 April. Call 612-624-3300 for more info.

OOPS, I'VE DONE IT AGAIN, ANOTHER MISTAKE -- Anita Cholewa

The Spring newsletter contained a moderately serious omission in Steve Eggers' lead article: "Beaked Spike Rush and the Discovery of a Calcareous Fen." The third sentence in the first paragraph should have read:

It was from the vantage point of the bluff that I recognized a "peat dome" in the wetland complex below. From past experience inventorying the Savage Fen and Fort Snelling State Park Fen, also in the lower Minnesota River valley, I knew that such peat domes are ideal locations for Minnesota's rarest wetland plant community, the calcareous fen.

My apologies Steve.



Water-plantain (Alisma plantago-
aquatica) from: Heywood, V.H. 1985.
Flowering Plants of the World.

1989/1990 MNPS Officers and Board of Directors

David McLaughlin, President (1990)	612-333-8806
Don Knutson, Vice-president (1990)	721-6123
Robin Fox, Secretary (1991)	642-9118
Charlotte Menzel, Treasurer (1990)	426-2860
Cole Burrell, Director-at-large (1992)	443-2460
Steve Eggers, Director-at-large (1990)	894-0071
Ellen Fuge, Director-at-large (1992)	
John Moriarty, Director-at-large (1991)	
Gerald Ownbey, Director-at-large (1991)	436-5365
Nancy Sather, Director-at-large (1992)	297-4963

Donations made to MNPS are tax deductible.

Minnesota Plant Press may be obtained through membership in the Minnesota Native Plant Society. The newsletter is distributed three times each year (fall, winter, spring). Items of interest for inclusion in the newsletter may be submitted by anyone but must be typed and doubled spaced (computer disks are welcome, but include a hard copy). The editor reserves the right to edit for grammar and clarity.

Minnesota Native Plant Society
220 Biological Sciences Center
University of Minnesota
St. Paul, MN 55108



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MINNESOTA PLANT PRESS

Newsletter of the Minnesota Native Plant Society v 9:2 winter 88

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U P C O M I N G M O N T H L Y M E E T I N G S

M N P S meets the first Wednesday of each month at 7:30 PM in 335 Borlaugh Hall, Univ. of Minn. St. Paul campus. Board meeting are at 6:00 PM in St. Paul Student Center Cafeteria on same evening; all society members are welcome to attend.

3 January 1990

Aspects of seed performance of some native plants
Ron Bowen

7 February 1990

Historical aspects of early Minnesota (pre-settlement) plant collectors
Mike Heinz

7 March 1990

Wilderness Values
Eville Gorham

Prairie Bush Clovers;

NEW INSIGHTS ON ENDANGERED AND COMMON
SPECIES

Christopher T. Cole, Ph.D.,
University of Minnesota - Morris

One of the fundamental questions facing people working in long-term conservation of endangered species-- especially plants-- is whether populations are genetically specialized for the area in which they occur. This kind of specialization is particularly common in plants that have the capacity for self-fertilization, such as *Lespedeza leptostachya*, a rare legume species native to the tall-grass prairies of

southern Minnesota, northern Iowa, and adjacent portions of Wisconsin and Illinois. This research also included the more common and wide-spread relative, *L. capitata*, allowing the necessary techniques to be developed without damaging the results of the *L. leptostachya* research.

Twelve different populations of each species were studied which provided a total of over 500 plants (including a hybrid between the two species) representing both the "core areas" in s.w. Minnesota and n.w. Iowa, where 90% of the *L. leptostachya* plants occur, as well as more distant populations in Minnesota, Wisconsin and Iowa.

Two different methods of genetic analysis were used on these two species. The first was the analysis of *allozymes* which are different forms of enzymes that serve as genetic markers, much as hair color and eye color do for humans. However, since there are many different kinds of enzymes that can be analyzed this way, it is possible to gain much more genetic information from these kinds of markers than is possible if only morphological markers are studied.

This kind of analysis of the genetic structure of populations has become quite common in the last twenty years, and was combined with a new method: a direct analysis of the DNA that occurs in the mitochondria of these plants. The significance of studying mitochondrial DNA (*mtDNA*) is that it is inherited only through the seed and not through the pollen. This study was the first time that



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these two methods were combined for plants, and the combination allowed some inferences about the factors affecting the population genetic structure-- especially the dispersal of pollen and seeds-- that could not have been made otherwise.

This had the surprising result of showing that there was no evidence of genetic variation in *L. leptostachya*. Even the *L. capitata* population showed remarkably little variation, although there was a strong pattern of differentiation among populations for the little variation that does occur. For the *L. leptostachya* populations, this means that efforts to re-establish this species could use seeds of transplants from the relatively large populations of the Core Area, and that there is little reason to expect specializations to particular sites. On the other hand, it also means that all of the plants are likely to be susceptible to the same pathogens or predators; these are known to occur in some populations, and it will be important to avoid inadvertently transferring these pathogens between populations.

The related research on *L. capitata* held some more surprises: Both species produce two kinds of flowers: small flowers specialized for self-fertilization; and larger, showy flowers that can be cross-pollinated by insects. However, these showy flowers turn out to be surprisingly ineffective at actually cross-pollinating plants. The petals that form the keel of the small, clover-like flowers close quite tightly around the stamens and style, and foraging bees and

beetles can remove the nectar from the flowers without opening the keel and cross-pollinating the flowers.

The combination of mtDNA analysis with the allozyme analysis for *L. capitata* further showed that there is sporadic, long-distance dispersal of seeds, which can result in the establishment of relatively isolated new populations: populations which are relatively close together but may be quite different genetically, since they came from different founding events and rarely exchange pollen or seeds after establishment.

National Forest Information

FOREST SERVICE NEWS
1992 FOLWELL AVE.
ST. PAUL MN 55108
(612) 649 5101

Information on current activities taking place in the U.S. National Forests in the Twin Cities area of the Midwest is available by local phone call to Twin Cities residents. Included are the Chequamegon and Nicolet National Forests in Wisconsin, and the Superior and Chippewa National Forests in Minnesota.

Al Taylor, USFS information specialist at 649 5101 has up-to-date information on hunting, fishing, skiing, snowmobiling, wood-cutting, and a variety of other activities of seasonal and special interest.

M N P S ELECTIONS

Elections for new Directors will take place at the annual meeting (March). Directors whose terms expire this summer are *Don Knutson*, *David McLaughlin*, and *Steve Eggers*. The following people have been nominated by the Board. If you do not plan to attend the March meeting, an *identified* absentee ballot (enclosed) may be cast by mail.

The Board extends its thanks to Chris Soutter for chairing the Nominations Committee.

The brief biological sketches below will assist you in choosing your officers and board members.

PAT RYAN

A resident of Cottage Grove, Pat raises sheep and gardens extensively. She also uses her green thumb in small prairie restoration project at her place in Cottage Grove. She also collects seeds from nearby prairie remnants for her own project and for seed sharing.

Pat is also a *Master Gardener* and is active in the League of Women Voters.

ELIZABETH RODDY

A graduate of the Univ. of Minn., Elizabeth has worked in Roseville's Central Park, where she catalogued its plants. This project led to publishing a book on the park, with her photographs, called *Walking with Open Eyes*. She is currently restoring wildflowers and native grasses to the park, and is beginning a small prairie restoration on the north side of Lake Bennet.

DON KNUTSON

Dr. Knutson has had a long interest in native plants, gardening and wildland management. An appointed member of the Board, he also served on the Conservation Committee. He was program coordinator for the Federal Research Natural Area Pro-gram for the Pacific north-west. His research background is in dwarf mistletoes (*Arceuthobium*); he has a special interest in reproduction biology of native plants.

 1990 M N P S Absentee Ballot

The following slate has been nominated to replace outgoing members of the MNPS Board of Directors. Board members serve three-year terms (September 1990 - September 1993)

	Yes	No
Pat Ryan.....	_____	_____
Elizabeth Roddy.....	_____	_____
Don Knutson.....	_____	_____
Write-in candidate*.....		

*MUST BE PAID MEMBERS FOR ONE OR MORE YEARS

Member's signature.....Address.....

1990 MINNESOTA BOTANY INTERNATIONAL EXHIBITION of PHOTOGRAPHY

NATURE SLIDES - 5
Botanical subjects only

Sponsored by MINNESOTA NATURE PHOTOGRAPHY CLUB and MINNESOTA NATIVE PLANT SOCIETY

Approved and listed by PHOTOGRAPHIC SOCIETY of AMERICA

PANEL OF SELECTION

Gary Ash Nature Photography Teacher
Anita Cholewa Ph.D.- Botany, Museum Curator
Alan Schulz Four Star Nature Exhibitor

CALENDAR

Closing	April 16, 1990
Judging	April 21, 1990
Report cards	April 25, 1990
Total rejects	April 27, 1990
Accepted entries mailed	May 21, 1990
Catalogs mailed	June 1, 1990

18 MEDALS

In special recognition of the efficient management of the last Minnesota Botany Exhibition, the Nature Division of PSA is presenting one Silver Medal.

PSA Medal for Best Wildlife.

Best plant(s) showing habitat.

Best non-flowering plant.

Best slide by an exhibitor outside USA.

3 medals to the best slide of 3 Minnesota residents.

11 medals - open category (Minnesota residents are not eligible for these 11 medals).

SHOWINGS

7:30 p.m. May 2 Borlaug Hall,
U of Minn., St. Paul, MN.
7:00 p.m. May 14 Central Community Center,
St. Louis Park, MN.

Address all correspondence to:

Richard Haug, CHMN.

MINNESOTA BOTANY - Richard Haug, CHMN.
2514 Pennsylvania Ave. S.
Minneapolis, MN 55426 USA



Showy Ladyslipper (Cypripedium reginae)
Minnesota State Flower

Entry form on reverse of this page

CLOSING DATE: April 16, 1990

6 CONDITIONS OF ENTRY

1. The exhibition is open to everyone, everywhere, and will be conducted in accordance with PSA recommendations. All acceptances will count toward PSA "Star Ratings" and be eligible for listing in PSA's "Who's Who".
2. Subject matter is restricted to BOTANY, which includes: flowering plants, non-flowering plants (fungi, lichens, mosses, ferns, Gymnosperms, etc.), habitats, and fossil plantlife. The photography should be done in such a fashion that a well-informed person will be able to identify the subject material and to certify to its honest presentation. Human elements, if present, should be unobtrusive and enhance the nature story. Photographs which depict artificially produced hybrid or horticultural varieties of plants may not be used. Photographs depicting still life studies, obviously set floral arrangements, mounted specimens, museum habitats or groups, derivations or any form of photographic manipulation that alters the truth of the photographic statement are ineligible and should not be submitted (Exception: detailed micro or macrophotography). The story-telling value should be weighed more than the pictorial quality.
3. Authentic Wildlife - Check the W column on the entry form following the titles that qualify. The maker certifies the subject is living free and unrestrained in a natural or adopted habitat.
4. Entry fee for (4) 2" x 2" slides, in U.S. currency, is \$4.00 for North American entrants and \$5.00 (or 13 IRC's) for Overseas entrants. Add \$2.00 (or 5 IRC's) for Air Mail return of Overseas entries. Foreign currency will not be accepted. Checks must be drawn on a U.S. bank and should be made payable to MINNESOTA BOTANY EXHIBITION.
5. Entries must include entry fee, completed entry form and labels. All slides shall have been exposed by the entrant. Slides must be spotted in the lower left hand corner when viewed from an upright position, and must bear the name and address of the maker.
6. Slides accepted in any previous Minnesota Botany Exhibition, or slides essentially identical, regardless of title, are ineligible.
7. Descriptive titles are strongly recommended. If you need help in identifying your subject, let us know. Give us all the information about your subject that you can, and we will try to identify it for you.
8. All possible care will be taken to safeguard entries, but the Exhibition Committee and the sponsoring clubs assume no responsibility for loss or damage to entries while in transit or during the Exhibition.

1990 ENTRY FORM

MINNESOTA BOTANY

Entry No.

Ck _____

C _____

RC _____

Name _____		PSA Honors _____	
Street _____		Nature Div. Star Rating _____	
City _____	State _____	Zip _____	Country _____
TITLE	Please print or type	W	Score
1			
2			
3			
4			
Entry forwarded from _____		Forward to (enclose label) _____	
Permission to reproduce slides is granted unless stricken.			

OPTIONAL: We would greatly appreciate any natural history information you can provide regarding your subjects, to be used in our public showings. This could include scientific name (if not used in title); where subject is native to; what habitat it is found in; anything unusual or significant shown.

New Members

Please welcome the following new members who have joined the *Minnesota Native Plant Society* this fall:

Jane Bennett, <i>St. Cloud</i>	Roger Bong, Sr., <i>Maplewood</i>
John Burns, <i>Wayzata</i>	Janet Chester, <i>Coon Rapids</i>
Glenda Christenson, <i>Maplewood</i>	Bette Drake, <i>Minneapolis</i>
Susan Fuerstenberg, <i>St. Paul</i>	John Furlong, <i>Brooklyn Center</i>
Cathi Gabrielson, <i>Hanover</i>	Dr. Oliver Johnson, <i>St. Paul</i>
Carol Kollander, <i>St. Paul</i>	Kate Lease, <i>Eagan</i>
Herbert, Barbara Noble, <i>St. Paul</i>	Chuck, Ellen Peck, <i>St. Paul</i>
Marcia Richards, <i>Mankato</i>	John Rolf, <i>Garfield</i>
Bob Ruhfel, <i>Minneapolis</i>	Sandra Sandell, <i>Minneapolis</i>
Greg Stark, <i>St. Paul</i>	Jean Strehlow, <i>Roseville</i>
Lois, Zoie Wennen, <i>Eagan</i>	

A MEMBERSHIP ROSTER WILL BE PRINTED IN NEXT NEWSLETTER

Proposed Change to MNPS Bylaws

The following change is proposed by the Board because the present procedure for nominating new Board members requires the incoming Board to begin a search for the following year's directors at its first meeting in order to have a slate of candidates ready for the January Newsletter. Also there have not always been sufficient Committee Chairs to form a Nominating Committee.

In order for these changes to become effective, two consecutive monthly ballots on the acceptance/rejection of the proposed amendments are required. Voting will be by secret ballot at the February and March meetings.

Article V Present wording:

Section F. The Board of Directors shall each year appoint a Nominations Committee of not less than three persons, drawn from the Chairpersons of the standing committees, to propose a slate of three new Directors in time for notice of the proposed slate to appear in the January (winter) issue of the *Minnesota Plant Press*. The Nominations Committee shall propose a slate of new officers for the Board of Directors.

Article V Proposed wording:

Section F. The Board of Directors shall each year appoint a Nominations Committee of not less than 3 persons chaired by a chairperson of a standing committee to propose a slate of 3 new directors, with notice of the proposed slate being mailed at least 30 days prior to the annual meeting. The Nominations Committee shall propose a slate of new officers to the Board of Directors.

Spring Symposium

Minnesota Native Plant Society will cosponsor the 1990 Spring Symposium with the Minnesota Landscape Arboretum on Saturday, April 7, 1990, from 830 AM to 430 PM at the Arboretum. The theme for this year is *Gardening with Minnesota Native Plants*.

The MNPS is pleased to ^{dedicate} 1990's spring symposium to May Wright, founding member of the society and expert native plant gardener.

The program will feature both lecture and workshop. Lecture topics include:

Why Native Plants? ..an investigation of which plants are truly native and why we should garden with them.

Native Plant Marketplace: propagation and wild collection ..a discussion of conservation issues involved in selling of native plants.

Designing with Native Plants ..a look at many ways of using native plants in home landscaping.

The afternoon will consist of concurrent workshops on the design, planting and maintenance of woodland, prairie and wetland gardens.

A brochure with program and registration information ~~is included in this newsletter~~. will be sent.

For more information contact Cole Burrell

Eastern Native Plant Alliance (ENPA)

The Eastern Native Plant Alliance is an association of representatives from organizations that promote and demonstrate commitment to protecting indigenous plant species and their habitats within the eastern deciduous forest and coastal plain provinces of eastern U. S. and southeastern Canada. Its goal is to provide a forum for sharing ideas and information, thus stimulating more effective programs and activities in all matters relating to native plant conservation. 29 representatives from 25 groups were represented at the second annual meeting of ENPA in Fletcher, NC, July 29-30, 1989. At this meeting, priorities for ENPA were set, based upon the interests and expertizes of the participants. Working groups were established to discuss these priorities and to explore ways of accomplishing the stated goals. The third annual meeting of ENPA will be held August 17-19, 1990, at the Holden Arboretum, Mentor, Ohio.

If you would like more information concerning ENPA or the upcoming meeting, please contact Cole Burrell

Volunteers

Like so many organizations, the Minnesota Native Plant Society relies heavily upon volunteer time, talent, enthusiasm, suggestions, and work. For those of you who believe that your efforts can make the future of Minnesota native plants more secure, there are many opportunities to combine your special skills and energies with those of others who believe as you do.

Just a few of the opportunities available to you are listed:

CONTRIBUTIONS TO THE NEWSLETTER
 DISPLAYS: MAKING AND MANNING
 FIELD TRIPS: PLANNING, MANAGING, ATTENDING
 MEETINGS AND SYMPOSIA
 PUBLICITY
 MEMBERSHIP
 MAILINGS: ADDRESSING, STAMPING, FOLDING
 COMMITTEES: MEMBERS, OFFICERS

Take a moment to consider how you would like to participate
 and then mail or call in the following:

M N P S Volunteer Sign-up

Name.....	Interest(s).....
Address.....
.....
City.....	Availability
	weekdays.....
State.....Zip.....	weekends.....
	evenings.....
Tel:(h)....	daytime.....
(w)....	

Your comments and suggestions are welcome.....

.....
 Please mail to:

MINN NATIVE PLANT SOC.
 DEPT OF BOTANY, U OF MINN
 220 BIO SCI CENTER
 ST. PAUL, MN 55108

or call:

SHIRLEY MAH KODYMAN

1989/1990 MNPS OFFICERS AND BOARD OF DIRECTORS

David McLaughlin, *Pres. (1990)* Don Knutson, *Vice pres. (1990)*
Robin Fox, *Secr. (1991)* Charlotte Menzel, *Treas (1990)*
Cole Burrell, *Director (1990)* Steve Eggers, *Director (1990)*
Ellen Fuge, *Director (1992)* John Moriarty, *Director (1991)*
Gerald Ownbey, *Director (1991)* Nancy Sather, *Director (1992)*
Ellen Fuge, Don Knutson, *Field Trips and Workshops*
James Ketchum, *Newsletter* Chris Soutter, *Historian*
Don Knutson, *Conservation* May Wright, *Education*

Donations made to M.N.P.S. are tax-deductible

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**Minnesota Native Plant Society,
220 Biological Sciences Center,
University of Minnesota,
St. Paul, Minnesota 55102**

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MINNESOTA PLANT PRESS

Newsletter of the Minnesota Native Plant Society v9:3 spring 90

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UPCOMING MEETINGS

4 April 1990

Botany of South Africa
Peg Kohring

7 April 1990

*Gardening with Minnesota
Native Plants*
Minn. Landscape Arboretum
8:30A - 4:30P

2 May 1990

*Botany Photographs,
Field Trip Review,
Spring Plant Sale*



Erica Faye

Native Plants On Minnesota Roadsides

Prior to European settlement the dominant vegetation community of nearly the entire upper Midwest was tallgrass prairie. However since that time, large expanses of native vegetation (including prairie) have become increasingly less common. Nearly one third of Minnesota was once native prairie; now less than 1% of it is left. Much of the native prairie that remains is found in areas that were unsuitable for agriculture, such as cemeteries, steep bluffs, and along rights-of-way. Rights-of-way have been recognized historically as refuges for native vegetation communities. This is particularly true of shared highway and railroad rights-of-way. Back in the 1800 & 1900s when railroads were first built, they transected the virgin tallgrass prairie of the upper Midwest. After tracks were laid down the surrounding prairie vegetation re-established back into the railroad right-of-ways that were initially disturbed by construction. Subsequently, many highways followed these early transportation routes and were built adjacent to railroad tracks. Frequently, long narrow corridors of prairie were isolated and protected in their shared rights-of-way. These corridors were left undisturbed by agriculture, while most of the rest of the surrounding prairie disappeared. Periodic fires along railroad rights-of-way have enabled the fire-adapted prairie species to flourish.

The Minnesota Department of Transportation (MnDOT) has recently completed a vegetation survey of it's trunk highway system in which nearly 3,600 acres of right-of-way were found to still contain high quality native vegetation communities. It is obvious that roadside rights-of-way are environments that are continually disturbed, whether it be from human activities, or from naturally occurring adverse climactic conditions. Vegetation on roadsides is exposed to automobile exhaust, salt and applied chemicals. It is also subjected to drought, flooding and extreme temperatures. Results of surveys performed by MnDOT botanists suggest that right-of-way native vegetation communities are less susceptible to drought-kill, weedy invasion, and erosion than those rights-of-way containing introduced species. It is thought that this is because native plants are better adapted to survive here than non-native plants and diverse plant communities (such as a prairie community) are more able to withstand adverse conditions and frequent disturbance than monoculture plantings or low diversity non-native communities. Findings such as this have been instrumental in getting MnDOT to try new vegetation management techniques.

For several years MnDOT has been managing the prairie community found along T.H. 56 between the towns of Rose Creek and LeRoy using a combination of prescribed burning and limited mowing. This unique strategy has been a cooperative effort between MnDOT and the DNR. Under this management regime the prairie along T.H 56 has flourished. Many species of native prairie plants can be found growing there. Some forbs include: Canada anemone (*Anemone canadensis*), buttercup (*Ranunculus* sp.), cinquefoil (*Potentilla* sp.), lead plant (*Amorpha canescens*), wild four-o'clock (*Mirabilis nyctaginea*), prairie phlox (*Phlox pilosa*), puccoon (*Lithospermum* sp.), spiderwort (*Tradescantia* sp.), blue-eyed grass (*Sisyrinchium* sp.), bedstraw (*Galium* sp.), wild rose (*Rosa* sp.), golden alexanders (*Zizia aurea*), stiff tickseed (*Coreopsis palmata*), grey-headed coneflower

(*Ratibida pinnata*), compass plant (*Silphium laciniata*), rattlesnake master (*Eryngium yuccifolium*), wild quinine (*Parthenium integrifolium*), turk's cap lily (*Lilium superbum*), prairie smoke (*Geum triflorum*), Canada tic-trefoil (*Desmodium canadense*), purple prairie clover (*Petalostemum purpureum*) and white prairie clover (*Petalostemum candidum*). There are several vetches, asters and indigos found there as well (Bob forgot his key that day). Some common grasses are: Big bluestem (*Andropogon gerardi*), little bluestem (*Schizachyrium scoparium*), Indian grass (*Sorghastrum nutans*), prairie dropseed (*Sporobolus heterolepis*), prairie cordgrass (*Spartina pectinata*), muhly grass (*Muhlenbergia* sp.) Canada wild rye (*Elymus canadensis*) and switch grass (*Panicum virgatum*). This stretch of Highway 56 was designated as the state's first Wildflower Route last summer and it also contains Shooting Star Prairie which is a DNR Scientific & Natural Area.

MnDOT has found that the use of herbicides and mowing for weed control have decreased along T.H. 56 and the use of prescribed fire has reduced chemical and mechanical removal of brush as well. This translates into direct cost savings over the years as herbicide use and mowing decreases. It is anticipated that under the present management plan that emphasizes the enhancement of the native prairie community along T.H. 56, the need for mowing will decrease to keeping the inslopes mowed short, the sight-lines clear for safety purposes and possibly patch mowing of weeds. This type of management plan decreases disturbance of the right-of-way by human activities substantially. Remaining disturbances are then left to natural causes (which are beyond our control), but for which the native species are adapted to survive.

There are a number of benefits to working with native vegetation along roadsides. Practical benefits to highway departments include the potential for a reduction in the cost of roadside maintenance and increased erosion control when native vegetation communities are present. Ecological benefits include the preservation of habitat for wildlife that utilizes roadsides for nesting cover and forage, the protection of rare plant and animal species, the potential preservation of natural genetic exchange between these species along linear corridors, and the protection of a significant percentage of the remaining tallgrass prairie communities in the upper Midwest. Rights-of-way containing native vegetation also serve as a seed source for future restoration efforts. Finally, native plants provide a display of seasonal color changes along roadsides, a "natural beautification".

To further explore the possibilities and benefits in working with native vegetation on Minnesota roadsides, the state has formed a task force composed of representatives from various state agencies, the University of Minnesota, private corporations, and the public sector. The task force serves to make recommendations and suggest guidelines for various state programs. The task force is also able to serve as an interface between the state and the public, with its growing interest in the use of native wildflowers and grasses for highway beautification. In addition, MnDOT and the DNR have begun cooperation (on a state-wide basis) in developing an integrated roadside vegetation management program. An interagency committee has been formed to set guidelines for this program. The two agencies are sponsoring a prescribed burn training workshop this spring for state

personnel and management practices to enhance native prairie communities similar to that being used along T.H. 56 will begin along a number of Minnesota highways in 1990.

The designation of T.H. 56 as Minnesota's first Wildflower Route is testimony to the fact that the goals of MnDOT, MnDNR and conservation groups can all be met, while at the same time the public benefits by seeing part of Minnesota's natural heritage flourishing once again along Minnesota's roadsides. More Wildflower Routes will be dedicated in the future, those slated for this summer are: T.H. 218 from Owatonna to Lansing Corners, T.H. 10 from Becker to St. Cloud, T.H. 212 from Olivia to Stewart, T.H. 9 from Benson to Breckenridge and T.H. 11 from Baudette to Greenbush. All of these routes contain remnant native plant communities, some of which are prairie and some of which are prairie/forest transition. T.H. 11 is noted for its spectacular show of orchids blooming in the spring. The dates for the upcoming dedications are still not set, however T.H. 11 will probably be dedicated on June 23rd and T.H. 218 may be dedicated on August 4th in association with the National Prairie Conference in Cedar Falls Iowa. The other routes will probably be dedicated in July and August. Final dates will be furnished to the media when they are decided upon. The dedications will be organized by local communities along the routes in cooperation with state agencies such as MnDOT, DNR, Department of Trade & Economic Development and Tourism. Activities will include a ribbon cutting ceremony, interpretive field trips to sites along the routes and various community activities culminating in a picnic or barbeque. Minnesota Native Plant Society members are invited to attend any or all of the dedications. We would love to see you there! If any of you are interested in participating in one of the dedications, either to help organize community activities or to lead an interpretive field trip, give me a call at .

Bob Jacobson (MnDOT Botanist)

Nancy Albrecht (DNR Resource Specialist and former MnDOT Botanist) performed much of the MnDOT vegetation survey. Kathy Bolin (DNR Resource Specialist) was instrumental in organizing and assisting in the management of the T.H. 56 right-of-way prairie and also helped organize the T.H. 56 Wildflower Route dedication last summer.

Available soon!
**MNPS Guide to Spring Wildflower Areas
in the Twin Cities Region
(Updated 1990)**

The updated Guide will be available at the *Wildflower Gardening Symposium* and at *MNPS* meetings. Cost is \$3.00, including postage. Orders may be sent to

Mn. Native Plant Society,
220 Bio Sci Center,
1445 Gortner Avenue,
St. Paul, MN 55108

Nancy Sather, Minnesota Natural Heritage Program

One of the most exciting experience's I've had as a botanist with the Minnesota Natural Heritage Program was relocating a "lost" population of Western Jacob's Ladder in northern Minnesota in 1988.

The Western Jacob's Ladder (Polemonium occidentale var. lacustre) is a midwestern variety of a western montane species. The nominate montane species was first described in 1890 and was at one time reported to extend throughout the western mountains from Arizona to Alaska, but appears more conservatively to extend from Colorado to Montana and Idaho. It is reported in the flora of Utah and Nevada to range through "open woods of the pinyon, yellow pine, aspen and spruce belts".

The saga of the midwestern variety began in 1944 when it was discovered by Olga Lakela in a cedar bog in Morcom township north of Hibbing. Lakela sent her collection to E.T. Wherry, who in 1945 separated it from the western species as variety lacustre. The only subsequent Minnesota collection was made by George Monson, an unknown collector, in 1946. This collection was from a spruce bog in French township, immediately south of Morcom Township. Despite a mileage and road number on Lakela's original collection label, attempts to relocate the original population failed and its reliability began to be questioned.

Then in 1984 a population of the same plant was reported from a cedar bog in Florence County, on the Nicollet National Forest in northeastern Wisconsin. This find prompted the nomination of Polemonium occidentale var. lacustre as a candidate for federal listing and the Office of Endangered Species encouraged the Minnesota Natural Heritage Program renew our attempts to relocate the lost Minnesota population.

The rediscovery of "lost" plant populations is the result of a combination of sleuthing, persistence, and luck. I first consulted Dr. Paul Monson at UMD, whom I knew to have looked for the plant, to learn where he had looked; and Drs. Cliff and Isabel Ahlgren of the Wilderness Research Center, who had formerly collected with Lakela, to see what they recalled of her field habits. Armed with a set of aerial photographs and the opinion that Lakela probably didn't go too far off the road, I entered the wetland at an point east of the county road where cedar was easily visible because of a cleared powerline right of way. Ten fruitless hours later I tried the west side of the road, where aerial photos revealed cedar hidden from the road by a ditchline overgrown with other species. After several more hours of searching I literally stumbled upon a patch of vegetative plants.

Western Jacob's Ladder is a perennial flowering plant with a slender horizontally creeping rhizome. The leaves of mature plants are each comprised of up to 13 ladder-like opposite leaflets 2-7 mm. wide, with entire margins and tapering tips. On juvenile vegetative plants the number of leaflets may be as few as 3 to 5, with rounded tips, giving the plant a superficial resemblance to the polypody fern. Vegetative mature plants often occur in clumps.

The flowering stem is up to 70 cm. tall with alternate leaves and several flowers arising in an openly branched elongate flower head. Each flower is about 1 cm. in diameter with five bright blue to violet petals that fade to white in the center. The number of flowers per inflorescence varies from 1 to around 50. The fruit is a stiff greenish-yellow to yellow-brown persistent capsule.

Both the Minnesota and Wisconsin populations of Western Jacob's ladder are found in open cedar swamps with a history of logging 20 to 50 years ago. In each case, although vegetative plants are found in areas with closed canopies, the greatest numbers of flowering plants are in open wet areas with little canopy or shrub growth. Some associated species at the Minnesota site include: Cornus canadensis, Mitella nuda, Cypripedium reginae, Pyrola asarifolia, Linnaea borealis, Coptis groenlandica, Athyrium felix-femina, Gymnocarpium dryopteris, Rubus pubescens, Circaea alpina, Habenaria hyperborea, Carex lacustris, Calamagrostis canadensis, Carex trisperma, Arethusa bulbosa, Saxifraga pensylvanica, Iris lacustris, Impatiens capensis, Caltha palustris, and Dryopteris cristata.

Unlike the more common spring-blooming Jacob's Ladder (Polemonium reptans), the Western Jacob's Ladder flowers in midsummer, from the last week in June through the first two weeks of July. There is no known overlap in range of these two Jacob's Ladder species in Minnesota. Polemonium reptans is restricted to deciduous forests in the Big Woods region of southeastern Minnesota, whereas Polemonium occidentale var. lacustre occurs only in northeastern Minnesota. Despite differences in phenology, range and appearance of the two species, anyone familiar with Polemonium reptans could easily recognize that the Western Jacob's Ladder belongs to the same genus.

The Minnesota Natural Heritage Program is continuing its search for new populations of the Western Jacob's Ladder. We would appreciate leads on any Jacob's Ladder plants observed in northern Minnesota. We are also seeking volunteers to assist with our search in St. Louis County around the 4th of July. Interested people please call _____ or _____ and leave your name and address so we can send you a volunteer application.

Mentha Rotundifolia
 ... a transient lodger
 Charles Argus

Introduced from southern Europe and cultivated as a perennial herb and ornamental, the Round-leaved mint (*Mentha rotundifolia*), has frequently escaped from gardens throughout the southern states, but according to Gleason (B&B), its establishment in the north is uncommon. Fernald, however, records it as naturalized from Maine west to Michigan and south to Florida, Louisiana and Texas. Bailey (Mn.Cult.Plants) also reports it in New Mexico.

Like other garden plants, the Round-leaved mint can escape cultivation, for varying lengths of time, beyond its established boundaries. A curious case in point is a small population from south-central Ottertail County which has persisted for at least three years in a roadside stand of quaking aspen and beaked willow near Clitherall Lake. Its flowers produce an ample nectar secretion at the base of the ovary and are visited by small colonies of coloeopters and, especially, dipters. A cursory examination of gardens in the area failed to disclose its origin.

Although this population can be assumed to be transient, its presence here adds a pinch of flavor to the miscellany of local botanical trivia and represents a record of escape far outside the naturalized range of this species. At the same time, it should be noted that all of the other species of *Mentha* in our area, except *M. arvensis*, are naturalized introductions from Europe, and the present record suggests a possibility, however remote or unremarkable, that *M. rotundifolia* could yet have the tolerance needed to join their ranks.

Treasurer's Report

<u>January 1, 1990</u>		<u>March 1, 1990</u>	
Checking Account	\$1856.68	Checking Account	\$2193.96
6 mo. CD (101189)	<u>1000.00</u>	6 mo. CD (101189)	<u>1000.00</u>
Total	\$2856.68	Total	\$3193.96

On March 1, 1990, we had a listing 241 memberships representing individuals, households, organizations.

If you have questions about specific items of income or expense, please contact Charlotte Menzel

MNPS needs a volunteer for auditing its books. Please contact any board member if you can assist.

Report of the Education Committee

Several letters about wildflower gardening were received by us and answered.

MNPS has a very informative display-case prepared by Dr. Anita Cholewa. Many thanks to Pat Ryan for setting it up and answering questions at the Prairie Days at Afton. Roy Robison of Landscape Alternatives also had a booth there. Anne Manty and Robin Fox similarly helped at Fall Festival Days at the Arboretum.

Several members took the time to attend a Planning Commission meeting at White Bear Lake. The discussion was about the old ordinances and their appropriateness with new gardens such as the Nature Prairie Garden of Peggy Erickson. Cole Burrell represented the Arboretum, Bob Djupstrom the DNR, Bonnie Harper the Mn/DOT, and Charlotte Menzel, Mary Risdall and May Wright the *MNPS*. The planners were thankful for our input and asked for further information. We are preparing a statement to be given to them on March 9.

Beginning with the spring edition of the *Minnesota Native Plant Press*, there will be a series of articles on native plant gardens and restorations.

Respectfully submitted,
EDUCATION COMMITTEE, Dr. Gerald Ownbey,
Charlotte Menzel, Mary Risdall, May
Wright, chair.

NEW MEMBERS

Please welcome the following new members who have joined the *Minnesota Native Plant Society* this winter:

Dennis Albrecht, Minnetonka	Joan Albrecht, Minneapolis
Frank D. Bowers, Stevens Point	Nancy M. Davis, Stillwater
Robert Engstrom, Minneapolis	Peggy Erickson, White Bear Lake
Terry Ferriss, River Falls	Adrian & Liz Gollledge, River Falls
Ann Haines, Minneapolis	Carol Hegre, Minneapolis
Diane Peck Hilscher, Plymouth	Leo Holm, Maplewood
Eldon Hugelen, Apple Valley	Beth R. Jarvis, Crystal
Sheila A. Jensen, Minneapolis	Nancy A. Johnson, Minneapolis
Mary Kado, St. Paul	Cindy & John Karwacki, St. Louis Park
John Kippley, Little Canada	Kathy Kittleson, Victoria
Erwin Mickelberg, Minneapolis	Minnesota Zoo, Apple Valley
Sonja Moseman, Hastings	Ms. Kathe Nelson, Gaylordsville
Susan L. Nelson, Corcoran	Marcie O'Connor, St. Paul
Jon Peterson, Hastings	Josephine Rapatz, Minneapolis
Connie Sansame, Northfield	Dr. Jerome Wagner, Anoka
Eric Weis, Ramsey	Robin E. Whaley, Knife River
Colette S. Wolf, Bloomington	

Field Trip Schedule

1990 Minnesota Native Plant Society 1990

Everyone is welcome to these expeditions. We encourage you to bring your friends along!

Bring your camera(s), binoculars, lunch....dress appropriately.

The schedule is reasonably firm:, although changes may occur. Call for most current status: Don Knutson

1. OVERNITE CAMPING TRIP 29 June - 1 July *Dr. Anita Cholewa*

Botanizing near Isabella, MN. Vegetation includes black spruce bogs, aspen/oak forests and mixed pine/hardwoods forests.

"Barebones" are available at Forest Service Campground on a lake with a beach. There is a rustic lodge in Isabella, if you prefer, but please make your reservations with the lodge.

Anita Cholewa and Lynden Gerdes will each lead a Saturday field trip. This expedition is limited to 8 people and reservations are a "must:" call Dr. Cholewa at _____ by 31 May 1990. Additional details and directions will be mailed to participants in early June.

2. ST. CROIX One day: 16 June 1990 *Dr. Jerry Ownbey*

Prof. Ownbey will lead a field trip to St. Croix river area where will see a constituted prairie within Afton State Park, and a gravel ridge near Bayport which is home to several unusual plants. Our guide has invited us to have our brown bag lunch at his home nearby where we will review the growth performance of native trees that were planted in the garden area over 20 years ago.

3. WHITE BEAR LAKE Half-day: 12 May 1990 *Art Hawkins*

At their home north of White Bear Lake, Art Hawkins will focus on plants that are beneficial to birds and mammals. He will discuss invasive plants and the management difficulties associated with them. Again, remember your binoculars!

4. SAVAGE FEN One day: 25 August 1990 *Steve Eggers and Ellen Fuge.* (See no. 6, below, for directions)

This very popular field trip is an opportunity to see the unusual plants associated with the alkaline bogs. Boots are highly recommended.

5. WEAVER LANDING One day: 21 July 1990 There are no designated trip leaders, although *Steve Eggers* and *Ellen Fuge* will be along.

This group get-together will meet at Weaver Landing, Weaver, MN, just off Hwy 61, south of Wabasha, MN. It is a canoe adventure, so either bring

your own canoe, or arrange with others. Here we will see the beautiful water lotus in bloom, as well as other pond and marsh plants. There is no limit to attendance.... but you must paddle your own canoe!

6. VOLUNTEER WORK DAY, SAVAGE FEN SCIENTIFIC AND NATURAL AREA. One day: 19 May 1990. 10:00A-4:00P Steve Eggers and Ellen Fuge

Purpose: to girdle buckthorn, aspen and willow plants that are invading this rare calcareous fen plant community and shading out the rare species of plants. Prescribed burning is not possible because of lack of natural fire breaks.

Bring lunch, boots, and a small hatchet or machete or pruning knife: some tools will be available on the site

There is a limit of 20 participants, so make early reservations with Julie Muehlberg,

Directions: Hwy 13 west through Savage, MN, to signal light where Hwy 13 turns south; proceed south about 1/2 mile to 128 Street; turn east on 128 Str. to dead-end; the SNA sign is visible at this point. Assemble at the SNA sign at 10:00A.

7. HENNEPIN NATIVE MATERIALS NURSERY AND PRAIRIE (RESTORED) One day: 9 June 1990 John Moriarty 476 4663 for details.

Announcing Publication of
PROCEEDINGS OF THE ELEVENTH
NORTH AMERICAN PRAIRIE CONFERENCE

1. Prairie Plant Communities; 2. Prairie/Grassland Preservation; 3. Grassland Management; 4. Fire and Prairie Biota; 5. Prairie Plants; 6. Prairie Animals; 7. Landscaping with Prairie Plants; 8. Landscape Competition/Photographic Awards

US\$20.00 Make checks payable to:
Eleventh North American Prairie Conference,
Dept. of Biology, ATTN Tom Bragg,
University of Nebraska at Omaha,
Omaha, NE68182-0040

Announcing
Twelfth North American Prairie Conference

August 5-9, 1990
University of Northern Iowa
Cedar Falls, Iowa

Contact: Daryl D. Smith, Univ. of Northern Iowa, Cedar
Falls IA. 50614 Tel.: 319/273/2238

VEGETATION SURVEY OF OTTAWA BLUFFS FEN

In the Spring 1989 (Vol. 8:3) issue of the Minnesota Plant Press I reported the discovery in October 1988 of a calcareous fen plant community along the bluffs of the Minnesota River in Le Sueur County. The article mentioned that follow-up vegetation surveys would be done during the 1989 growing season.

The first of two surveys during the 1989 growing season was conducted on May 27. I specifically timed the survey to coincide with the peak of the white ladyslipper (*Cypripedium candidum*) bloom. Whereas populations of white ladyslippers were in full bloom at this time in other Minnesota River valley calcareous fen communities (e.g., Fort Snelling State Park Fen), I did not find any white ladyslippers in the Ottawa Bluffs Fen. This is puzzling in that the habitat is ideal and Welby Smith (Botanist with the Natural Heritage Program) informed me that he had located large populations of white ladyslippers in other areas of this same wetland complex. I intend to survey the fen this spring to again search for white ladyslippers.

A highlight of this fen is that one of the dominant species is beaked spike rush (*Eleocharis rostellata*), a species listed as threatened in Minnesota. This population, and that of the Savage Fen also located in the Minnesota River valley, are about 200 miles disjunct from the other seven Minnesota populations of beaked spike rush. A range map was included as part of the article that appeared in the Spring 1989 issue.

The fine, caespitose sedge I previously reported was confirmed to be sterile sedge (*Carex sterilis*), another threatened species. Other notable species included cottongrass (*Eriophorum angustifolium*) and marsh marigold (*Caltha palustris*). An interesting feature was a large, iron-rich spring upwelling downslope of the calcareous fen community.

Welby joined me for the second survey on August 19. In short order we found two additional species listed as threatened in Minnesota: nut-rush (*Scleria verticillata*) and fen beak rush (*Rhynchospora capillacea*), both members of the sedge family. Other notable species were bog arrow grass (*Triglochin maritima*) and a native loosestrife (*Lythrum alatum*), not to be confused with the noxious purple loosestrife (*Lythrum salicaria*). Showy wildflowers included blazing star (*Liatris ligulistylis*) and great lobelia (*Lobelia siphilitica*).

In total, 81 species were identified within the fen including four listed as threatened.

One final note: an unauthorized dredge and fill activity adjacent to the fen was reported. The person doing the work subsequently applied to the Corps of Engineers for an "after-the-fact" permit pursuant to Section 404 of the Clean Water Act. Additional dredge and fill is also proposed. The purpose of the project is wildlife habitat enhancement. As part of the permit review, the Corps will consider any potential impacts to the fen and work with the applicant to determine the best options available.

-- Steve Eggers

RELATIVE FLOWERING TIME, HEIGHT AND COLOR
OF SOME WOODLAND WILDFLOWERS IN A
CENTRAL MINNESOTA GARDEN

<u>Common/Scientific Name</u>	<u>Flower time</u>	<u>Height</u>	<u>Color</u>
Snow Trillium	March-May	Low	White
<i>Trillium nivale</i>			
Sharp-lobed Hepatica	March-May	Low	White, pink
<i>Hepatica acutiloba</i>			blue, lilac
Round-lobed Hepatica	March-May	Low	--same--
<i>Hepatica americana</i>			
Bloodroot	March-May	Low-Med.	White
<i>Sanguinaria canadensis</i>			
False Rue Anemone	March-May	Low-Med.	White
<i>Isopyrum biternatum</i>			
Bellwort	Mid-May	Medium	Yellow
<i>Uvulana sessifolia</i>			
Large Trillium	Mid-May	Medium	White fade
<i>Trillium grandiflorum</i>			to pink
Blue Phlox	Mid-May	Low	Blue
<i>Phlox divaricatum</i>			
Nodding Trillium	Mid-May	Medium	White
<i>Trillium cernicum</i>			
Yellow Lady's slipper	Mid-May	Medium	Yellow
<i>Cypripedium pubescens</i>			
Merrybells	Mid-May	Low	Cream
<i>Uvularia sessilifolia</i>			
Jack-in-the-pulpit	May-June	Medium	Green with
<i>Arisaema triphyllum</i>			purple str
Blue Cohosh	May-June	Tall	Yellow
<i>Caulophyllum thalictroides</i>			
Wild geranium	May-June	Medium	Lilac
<i>Geranium maculatum</i>			
Wild columbine	May-June	Medium	Red, yellow
<i>Aquilegia canadensis</i>			
Rosy twisted-stalk	May-June	Medium	Pink
<i>Streptopus roseus</i>			

Wildflower Route

THE GALLERIA, EDINA, MN.
March 17, 1990 — April 14, 1990

A route of *Wildflower Works of Art* in progress by Edina Art Center artists will lead customers through the shopping complex. An information booth in the route will be staffed by wildflower experts to answer questions, information about support groups will be available, and Minnesota wildflower seeds will be available for nominal donations. Profits will go toward the Minnesota branch of the *National Wildflower Research Center*.

Saturday seminars will be conducted on Minnesota Wildflower activities:

March 17	11:00A	<i>Bonnie Harper-lore, MN/DOT</i> ROADSIDE WILDFLOWER RESTORATION
	2:00PP	<i>B. J. Farley, MN DNR</i> THE NATURAL HERITAGE PROGRAM
March 24	11:00A	<i>Kathy Bolin, MN DNR</i> WILDFLOWER ROUTES AND PRESERVATION
	2:00P	<i>Peter Schaefer, MN DNR</i> ROADSIDES FOR WILDLIFE
March 31	11:00A	<i>Cole Burrell, MN Landscape Arb.</i> USE OF PRAIRIE AND WOODLAND WILDFLOWERS IN GARDENING
	2:00P	<i>Ron Bowen, Prairie Restorations Inc</i> WILDFLOWERS AND THE LAW
April 7	11:00A	<i>Kathryn Malody, former MN DNR</i> WILDFLOWERS OR WEEDS: THE DIFFERENCE
	2:00P	<i>Fred Sommers, Artist</i> A LOVE AFFAIR WITH NATURE
APRIL 14	11:00A	<i>STEVE EGGERS, USARMY CORPS</i> USE OF WETLAND WILDFLOWERS
	2:00PTO BE ANNOUNCED....

Mn/DOT Technical Services Division assisted in organization of the
 GALLERIA "WILDFLOWER ROUTE"

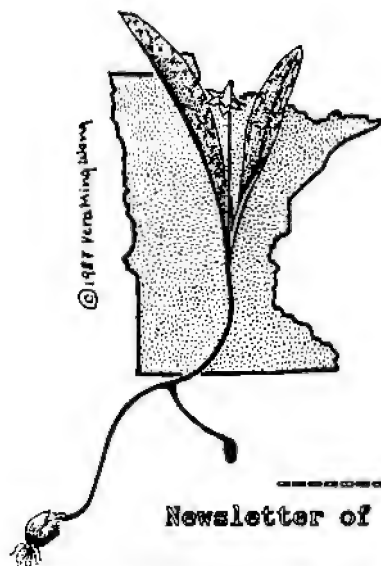
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Minnesota Plant Press may be obtained through membership in the *Minnesota Native Plant Society*. The newsletter is distributed three times a year (fall, winter, spring). Items of interest for inclusion in the newsletter will be welcome. Please submit typed, double-spaced copy: submissions via computer disks are welcome, but please include hard copy and identify word processing program.

**Minnesota Native Plant Society,
 220 Biological Sciences Center,
 University of Minnesota,
 St. Paul, Minnesota 55102**



MINNESOTA PLANT PRESS

Newsletter of the Minnesota Native Plant Society v9:3.1 spring '90
Special Spring Supplement

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U P C O M I N G M E E T I N G S

May 2, 1990

Botany Photographs
Field Trip Review
Spring Plant Sale

7:30P - Borlaug Hall - Map on page 7

F i e l d T r i p S c h e d u l e

1990 Minnesota Native Plant Society 1990

Everyone is welcome to these expeditions...bring your friends along! Bring your cameras, binoculars, lunch....and dress appropriately.

The schedule is reasonably firm, although changes may occur: call for most current status: Char Menzel 612 426 2860

White Bear Lake Half day 12 May 1990 10:00A - *Art Hawkins*

At his home north of White Bear Lake, Art Hawkins will focus on plants that are beneficial to birds and animals. He will discuss invasive plants and the management difficulties associated with them. Bring your binoculars!

Directions: 35E to Co Rd J, west 1/4 mi. to Centerville Road, N 1/4 mi. to house.

Volunteer Work Day: Savage Fen Scientific and Natural Area

One day: 19 May 10:00A-4:00P *Steve Eggers and Ellen Fuge*

Purpose: girdle buckthorn, aspen and willow plants that are invading this rare calcareous fen plant community and shading the rare plants. Burning is not possible because of the lack of natural firebreaks.

Bring lunch, boots, small hatchet or pruning knife: some tools will be available.

Directions: Hwy 13 west through Savage, MN, turn south at traffic light (Hwy 13 turns south here), 1/2 mi. to 128 Street, east to dead-end; the SNA sign is visible at this point. Assemble at SNA sign at 10:00A

Hennepin Parks Native Materials Nursery and Prairie (restored)

One day: 9 June 09:00A *John Moriarty*

The trip will take place at the Crow-Hassan Park Reserve: the nursery is a leader in native woody plant and forb propagation; the prairie encompasses over 500 acres.

Call for directions: 612 476 4663

St. Croix One day: 16 June *Dr. Jerry Ownbey*

Dr. Ownbey will lead a field trip to St. Croix river area where we will see a reconstituted prairie within Afton State Park, and a gravel ridge near Bayport which is home to several unusual plants. Dr. Ownbey has invited us to have our brown bag lunch at his home nearby where we will review the growth performance of native trees planted over 20 years ago.

Directions: Meet in parking area Afton State Park 9:00A

Overnight Camping Trip 29 July-1 July *Dr. Anita Cholewa*

Botanizing near Isabella, MN. Vegetation includes black spruce bogs, aspen/birch forests and mixed pine/hardwoods forests..Be prepared for ticks, mosquitoes and black flies.

"Barebones" quarters are available at Forest Service campground on a lake with a beach. There is a rustic lodge in Isabella, the National Forest Lodge, if you prefer, *please make arrangements with the lodge.*

Dr. Cholewa and Lynden Gerdes will co-lead a Saturday Field Trip. This expedition is limited to 8 people: reservations are a must: *call Dr. Cholewa at 612 625 0215 by 31 May.*

Additional details and directions will be mailed to participants in early June.

Weaver Landing One day: 21 July *Steve Eggers and Ellen Fuge.*

This group get-together will meet at Weavers Landing, MN, at 1030A, just off Hwy 61 south of Wabasha, MN. It is a canoe adventure, so bring your own or make arrangements with others.

Studying the Rough-Seeded Fameflower in Minnesota

Steve Fifield, Plant
Biology Dept., U. of Minn.

I spent part of last summer travelling around the Midwest searching for populations of *Talinum rugospermum* BOLZ., the rough-seeded fameflower. The rough-seeded fameflower is endangered in Minnesota and rare throughout its range. An irony of working on rare plants is that they do not always occur in pristine natural areas. Sometimes they hang on in the midst of sprawling parking lots, highways and steel mills. This became increasingly clear to me last summer in Indiana as my host, Noel Pavlovic, a biologist at the Indiana Dunes National Park, directed me to go to the back of a K-Mart parking lot not far from Gary. There we followed a series of all-terrain-vehicle trails to a small population of fameflower. The population is in a remnant oak savanna on top of an ancient sand dune deposited as Lake Michigan receded several thousand years ago. The population lies on and adjacent to an ATV trail which, while threatening to existence of the plants, may also be the disturbance that exposed bare soil and allowed the fameflower to germinate and establish itself in this area. This ironic relationship between human activity and the fameflower was evident at many of the sites I visited. We often think of plants being rare because of human activity, but fameflower often grows best in areas of moderate human disturbance.

Rough-seeded fameflower is in the *Purslane* family and is distinctly related to *Portulaca grandiflora*, the moss rose. Approximately 50 species are in the genus *Talinum*, most of them grow in the southwestern United States and Mexico. Only two species occur in Minnesota, *T. rugospermum* and *T. parviflorum*, the small-flowered fameflower. The small-flowered fameflower is fairly common on rock outcrops in southwestern Minnesota and

extends throughout much of the central United States. The rough-seeded fameflower has a more limited distribution occurring on sand prairies, savannas and rock outcrops in Minnesota, Wisconsin, Iowa, Illinois, and Indiana. A few very interesting outlying populations occur in Nebraska, Kansas and Texas. The tubular, fleshy leaves and short perennial stem make the fameflower unmistakable, although the plant is small and inconspicuous.



I have been conducting field studies on two populations of the rough-seeded fameflower in southeastern Minnesota at the Nature Conservancy's Weaver Dunes Preserve in Wabasha County and in the Whitewater Wildlife Management Area in Winona County. These sites are a far cry from the "K-Mart site" in Indiana. The Whitewater site is a small sand prairie at the base of a wooded bluff in the Whitewater River Valley. While the uplands surrounding the valley have been extensively altered by agriculture, the valley itself retains much of the original character. The slopes of the bluffs are thickly wooded, and steep goat prairies run along the south and west crests of the bluffs. The Weaver Dunes site is a beautiful sand

prairie, though it is anything but pristine, having recovered from many years of intensive agricultural use. In fact, the fameflower at Weaver Dunes tends to grow best along old tractor trails that cross the prairie. The eroding edges of these ruts seem to provide favorable sites for germination and establishment.

My research on fameflower is focused on its reproductive ecology and population genetics. I have established plots at both sites within which every individual is mapped. These sites are monitored regularly to track the survival of individuals and to assess the affect on fameflower of prairie management techniques such as burning. I have also studied the flowering phenology of fameflower. Fameflowers bloom throughout most of the summer, but flowers are only open from approximately 4:30PM to 7:30PM. This unusual flowering pattern is common in the genus, but it is not known why it evolved. At the Whitewater site, the mass flowering display transforms the brown colored prairie into a field of pink in the late afternoon. Since the plants otherwise tend to blend into the background, the late afternoon is a good time to search for them.

Working on plants in the field and in a greenhouse, I have studied the pollination ecology and mating system of fameflower. Because of the structure of its flowers, fameflower is primarily self-pollinating. When the flowers close in the evening, pollen bearing structures are pushed into the receptive female part of the flower causing self-pollination. Several types of small insects are attracted to the flowers in the field and they cause further self-pollination. This type of mating system contributes to inbreeding which should produce relatively low levels of genetic variability in the species-- individuals should be genetically very similar to each other. However, fameflower occurs in small isolated populations and this can lead to genetic differentiation between populations. Therefore, my next goal is to study the population genetics of fameflower to determine whether the

species is genetically uniform or composed of genetically distinct populations. This has important implication for conservation, since to preserve the genetic diversity of living things, we must know how much diversity there is and how it is distributed among populations.

The research I do is motivated by my fascination with living things and my commitment to conservation. It is not by chance that much of the work I do is in the field. I do my research in the company of wild turkeys, soaring turkey vultures and deer that constantly peer out at me from the woods. Sitting on a sand prairie at dusk, feeling the heat of the day radiate back into the sky and watching the sun set behind dark limestone bluffs is an experience that my colleagues who spend their careers in the lab. will never have. This is a great loss for them, for being in nature while studying it puts science in perspective and reminds you what biology is all about.

Acknowledgements: The following organizations have provided funds for my research: Carolyn M. Crosby Fellowship and the Dayton Natural History Fund, Univ. of Minn.; The Nature Conservancy; and the Roger Tory Peterson Institute for Natural History.

New MNPS Board Members

At the April Meeting of MNPS, the following were elected to serve on the Board for three years, from Sept '90 to Sept '93

(Because of the inclement weather and the consequent sparse attendance, the election was not held at the March meeting).

Pat Ryan Elizabeth Roddy
Don Knutson

Biographical sketches were included in Winter issue of *Plant Press*.

Agricultural Inspectors Need Educational Support

Nancy Sather, Minnesota Natural Heritage Program

We appear to be in an era of burgeoning interest in wildflowers and native species, evidenced by an increasing number of prairie restorations in the state, the development of wildflower routes along major roadways and the impending opening of a *Midwest Wildflower Center*. In keeping with this growing interest in native plants, citizens have become more knowledgeable about native vegetation and more concerned about agricultural and forestry practices that were considered not merely acceptable but necessary only a few years ago.

Over the past few months there has been some consternation within the conservation community about the activities of "weed inspectors." Incidents have been reported in which agricultural inspectors have mistaken native prairie plants for either Canada thistles or purple loosestrife, and have ordered spraying at the expense of landowners. The state's weed enforcement staff consists of about 5800 township, 850 city and 92 county agricultural inspectors, all funded by the respective local units of government. Funding for these positions therefore varies from local unit to unit, and is dependent upon fluctuations in overall local budgets. Most agricultural inspectors are not full-time positions, yet they are responsible both for enforcement of the state's noxious weed laws and for feed, fertilizer and pesticide control programs.

Just as the general public is increasing in awareness of the importance of native species, state agencies have begun to re-examine their policies and practices. An interagency *Exotic Species Task Force* is seeking to define "native," "non-native," and "exotic" species. Among the participants in this task force is Chuck Dale, head of state agricultural inspection program. I asked him to provide us with an update on the *Minnesota Department of Agriculture's* attempt to standardize and raise the level of competence of local inspectors. Projects in place, or being developed, include: a standardized position description that can be used by local units of government, a qualification exam, assistance in the interview process for new inspectors, an accreditation program for trained agricultural inspectors and annual training programs for county inspectors.

For the past several years, the State Department of Agriculture has called upon both the Minnesota Natural Heritage Program and the purple loosestrife program to assist with annual training for county inspectors. Specifically, they have requested workshops on the identification of endangered species and of natural communities. As a result of such workshops, Heritage staff has been invited to conduct a workshop for township inspectors in Jackson County and to assist the Martin County inspector in evaluation of a half dozen Martin County prairies not previously known to the Heritage Program.

One of Chuck Dale's hopes for improving the field knowledge of agricultural inspectors is the development of a convenient loose-leaf manual for identification of exotic and "weed" species, including both color photographs and easily understood but accurate technical descriptions. He has discussed with the Heritage botanists the possibility of developing similar loose-leaf pages for assistance in identification of endangered plants and native communities.

Despite incidents of mistaken identity in the past, now is the time for those interested in the conservation of native plants to express their concern about agricultural inspection issues in a positive way. Such positive efforts could include lobbying in support of increased funding for training and evaluation of inspectors and for solid funding for county agricultural inspectors as professional agricultural regulatory officials, support for such activities as the Exotic Species Task Force and contributions of voucher specimens for educational workshops or photographs for the development of an identification manual. Now is a time for open constructive communication between advocates of native plants and the agricultural inspection community.

D. N. R. Spring Fling **Saturday, April 28 - 10:00A-4:00P**

The Spring Fling is a celebration of spring in the outdoors, with activities for all ages: guided wildlife/wildflower walks, special hikes for families with small children, live displays of endangered and rare animals, and slide show/video presentations of natural history of Cannon River Valley.

This is also the kickoff for DNR's County Biological Survey in Rice and Goodhue counties.

The Spring Fling will be at the 4-H Building at Rice County Fairgrounds in Faribault on Saturday, April 28, from 10:00A to 4:00P. Chartered bus will take visitors to Rice County Wilderness Area for outdoor activities.

D.N.R. IS INVITING VOLUNTEERS TO AID IN TWO ACTIVITIES:

DURING THE SPRING FLING, DNR ECOLOGISTS WOULD WELCOME HELP IN LOCATING ADDITIONAL STANDS OF MINNESOTA DWARF TROUT LILY, WHICH IS FOUND ONLY WITHIN RICE AND GOODHUE COUNTIES. (CONTACT: B. J. FARLEY, 612 296 8217)

DURING THE BALANCE OF THE YEAR, D.N.R. WELCOMES VOLUNTEER ASSISTANCE IN ITS CONSERVATION EFFORTS. (CONTACT: NANCY SATHER, 612 297 4963)

Guild of Natural Science Illustrators

Annual Meeting: June 16-22, 1990

The Guild of Natural Science Illustrators (GNSI), an international organization of professional and amateur artists will hold its annual meeting and conference

June 16-22, University of Minnesota St. Paul Campus.

Included are lectures, demonstrations, field trips, in-depth workshops, and a juried exhibition at the Bell Museum.

For more information, call 612 624 6053.

Rare Bladderswort Revisited

Welby Smith

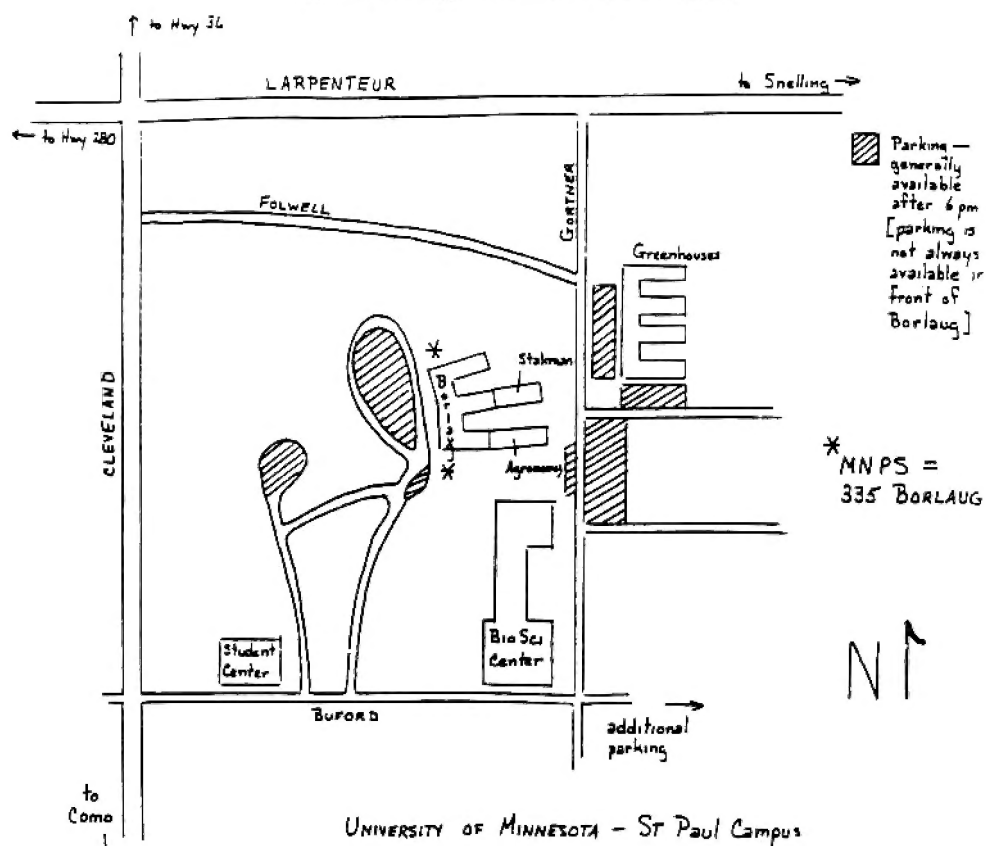
Readers of the *MNPS Plant Press* may recall back in the spring of 1988 I reported on the discovery of the "upside-down bladderwort" (*Utricularia resupinata*) at Makwa and Pan Lakes. It was the first report of the rare species in Minnesota and it attracted a lot of attention. Its habitat is the shallow margins of sandy-bottomed lakes in the BWCA, an unusual habitat in the region of ice-scoured bedrocks.

I was delighted to receive several tips from readers who knew of potential habitats. A number of people specifically mentioned Frost Lake in Cook County. In August of 1989, Vera and I took a week-long vacation in the Boundary Waters, and made a point to visit Frost Lake. It turned out to be the highlight of the trip! When we arrived, we found a vast sandy shoreline with what seemed like acres of bladderwort. The plants formed a solid mat about one-half inch beneath the sand with only their flower stalks poking up.

Thanks to all who offered suggestions, especially to Sue Trull who responded all the way from Missoula, Montana. I am still interested in hearing of possible habitats: drop me a note c/o *MNPS*.

By the way, if anybody knows of a better common name for this crazy plant, please let me know.

Meeting Location Map



Northstar Native Plant Handbook
A Minnesota Native Plant Society Project
 ..OR GREEN THUMBS AND DIRTY KNEES

During the far-ranging discussions at the January meeting of *MNPS*, it became clear that there is great interest by the members of *MNPS* in the growing and propagation of native plants. Two additional features also became clear: First, many members do not feel that they are getting enough useful information on the subject; and, second, there are some members who have impressive and successful experiences which could be shared.

A search of literature readily available to Upper Midwest native plant gardeners is disappointing for several reasons: its old; it doesn't adequately address Minnesota native plants; and it doesn't cover propagation. This prompts the question: Where is the information concerning growing and propagating Minnesota native plants? The answer is two-fold: some of it does *not* exist, but a lot of it *does* exist in the form of members' experience, but has not been published. In any case, there is a dearth of material available to concerned native plant gardeners.

Such a lack dampens the enthusiasm of those who wish to show their concern by participating in this awakened appreciation of our native plants.

The solution?.....write our own handbook: *Northstar Native Plant Handbook...OR GREEN THUMBS AND DIRTY KNEES*.

As we enter a new spring, we have the ideal opportunity for gathering the fruits of our experiences in the germination, propagation, growing of Minnesota's native plants. The combined experience of 50 members of *MNPS* will produce more results than years of academic/government/laboratory research.

What can we do about it?

As a new season of growth appears in Minnesota, *MNPS* urges its members to keep records and notes their experiences in growing and propagating native plants. Then, send those notes to the newsletter editor who will collect and compile them for review, after which they will be published.

This sounds like a lot of work-- and it will be-- but it is a small price to pay to save and share the valuable experience of all of *MNPS*'s green thumbs.

Please keep a notebook of your native plant gardening: identify the plant(s) (scientific names, if known); seed or vegetative propagation; soil; woodland/prairie/wet lands/etc.; special germination techniques; flowering time; fertility; .. whatever you have found useful.

SPRING PLANT SALE

May 2, 1990

The annual sale of wildflower garden transplants and seedlings will be at the May 2, 1990 meeting of the MNPS.

One of the goals of the MNPS is to promote the conservation and appreciation of native plants. We can enjoy wildflower gardening without disturbing native populations by creating gardens with plants started from seed or with transplants from other gardens. Our plant sale is one way to acquire some of these plants. Also, it is a fundraiser for our society, with the proceeds going into the general treasury. A \$1.00 donation is the suggested price for each plant purchased. Help make this project a success by donating and buying native plants started from seed and/or native wildflower transplants from members' gardens.

Do Not Collect Plants from the Wild for this Sale!

Plants should be labelled with the name of the plant (include scientific name if possible) and the name of the donor. Please divide transplants and have them in individual pots. Come early to drop off your plants: this will give us time to organize them.

The sale will be held after the program. Those who have donated plants will have first opportunity to make 3 selections; then the sale will be opened to all. You do not have to donate plants to participate in the sale

NEW MEMBERS

Please welcome the following new members who have joined the *Minnesota Native Plant Society* this winter:

Dennis Albrecht, Minnetonka	Joan Albrecht, Minneapolis
Frank D. Bowers, Stevens Point	Robert Engstrom, Minneapolis
Peggy Erickson, White Bear Lake	Terry Ferriss, River Falls
Adrian & Liz Golledge, River Falls	Ann Haines, Minneapolis
Carol Hegre, Minneapolis	Diane Peck Hilscher, Plymouth
Leo Holm, Maplewood	Eldon Hugelen, Apple Valley
Sheila A. Jensen, Minneapolis	Nancy A. Johnson, Minneapolis
Mary Kado, St. Paul	Cindy & John Karwacki, St. Louis Park
John Kippely, Little Canada	Kathy Kittleson, Victoria
Erwin Mickelberg, Minneapolis	Minnesota Zoo, Apple Valley
Sonja Moseman, Hastings	Ms. Kathe Nelson, Gaylordsville
Susan L. Nelson, Corcoran	Marcie O'Connor, St. Paul
Jon Peterson, Hastings	Connie Sansame, Northfield
Dr. Jerome Wagner, Anoka	Eric Weis, Ramsey
Robin E. Whaley, Knife River	Colette S. Wolf, Bloomington

1989/1990 MNPS OFFICERS AND BOARD OF DIRECTORS

David McLaughlin, *Pres. (1990)* Don Knutson, *Vice pres. (1990)*
 Robin Fox, *Secr. (1991)* Charlotte Menzel, *Treas (1990)*
 Cole Burrell, *Director (1990)* Steve Eggers, *Director (1990)*
 Ellen Fuge, *Director (1992)* John Moriarty, *Director (1991)*
 Harriet Mason, *Director (1991)* Nancy Sather, *Director (1992)*
 Ellen Fuge, Don Knutson, *Field Trips and Workshops*
 James Ketchum, *Newsletter* Chris Soutter, *Historian*
 Don Knutson, *Conservation* May Wright, *Education*

Donations made to M.N.P.S. are tax-deductible

Minnesota Plant Press may be obtained through membership in the Minnesota Native Plant Society. The newsletter is distributed three times a year (fall, winter, spring). Items of interest for inclusion in the newsletter will be welcome. Please submit typed, double-spaced copy: submissions via computer disks are welcome, but please include hard copy and identify word processing program.

Minnesota Native Plant Society,
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